SEPTEMBER 1953

American Engineer

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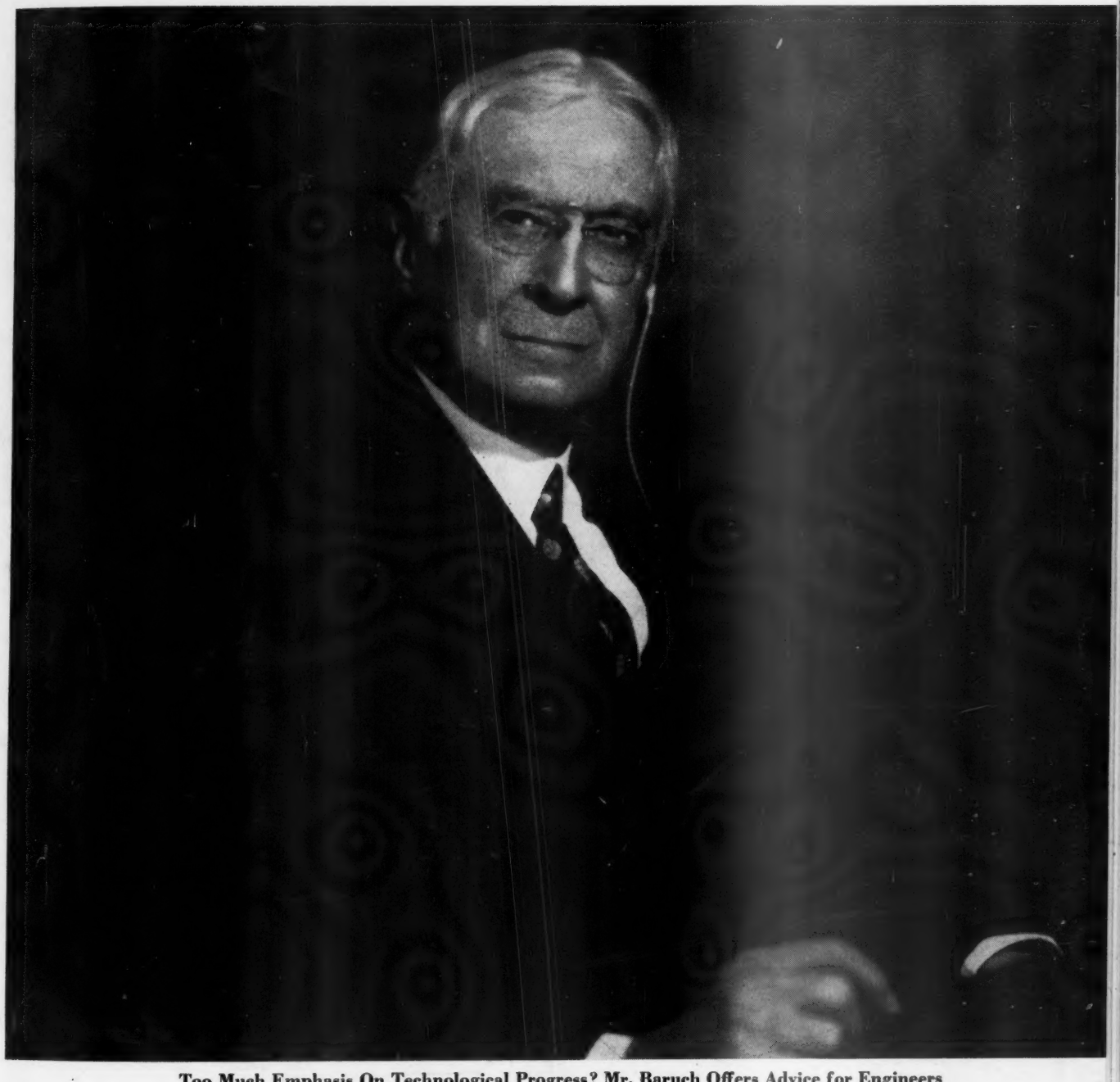
IN THIS ISSUE . . .

● **NEEDED: A SURE SENSE OF VALUES**

By Bernard Baruch,
Noted Financier and Statesman



Too Much Emphasis On Technological Progress? Mr. Baruch Offers Advice for Engineers

. . . *Also*

Special Washington Report Written For Engineers

●

Design Factors In Engineering Unity —By NSPE V. Pres., Clarence T. Shoch, P.E.—

●

Plus Articles and Features of Professional Interest

. . . NEW LITERATURE . . .

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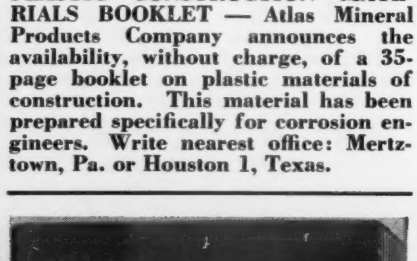

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46 new case studies explain clearly and factually how standard packaged electronic controls have solved many problems of weighing, counting, measuring, timing and cycling, thereby achieving new efficiency through the use of electronic controls for all types of industrial applications. Address Photoswitch Inc., 77 Broadway, Cambridge 42, Mass.

DRYERS—A new, four page brochure on Rock and Sand Dryers has been issued by the Standard Steel Corporation. This bulletin, No. 5323, contains information on the rugged frame mounting, compact electric drive, and combustion chamber, and has close-up photos of its trunnion wheels and tire mounting. In addition, details are given on the latest Standard Dust Collectors and Wet Washing Systems. Address: Standard Steel Corporation, 5001 S. Boyle Ave., Los Angeles 58, Calif.

—AE—

FOR CONTRACTORS—Of particular interest to Contractors is the just completed "The Effect of Vibration From Commercial Blasting" by Harold H. White, Consulting Engineer. The 52 page booklet is replete with charts, photos, and graphs which show all phases of vibration effect. Mr. White, who specializes in Industrial Seismology, offers one copy of the booklet free to interested Contractors. Additional copies, $2.00 each. Write Harold H. White, Consulting Engineer, 1831 Picher Ave., Joplin, Missouri.

BROCHURE ON PLASTIC PRODUCTS —Illustrated. Includes information on: extrusion injection fabrication; plastic tubing for every purpose (medical, chemical, electrical, packaging, gauges, water pipe, oil and gas lines, etc.); extruded gaskets (for metal buildings, refrigerators, appliances, storm windows, etc.); plastic shapes for profile extrusions, belting and trims, and flat strips for stamped products; injection molding and fabrication (pipe fittings, vacuum wands, custom fabrications). Contains tables and definitions — easy-to-read specifications on plastic terms and applications. Write Yardley Plastics Co., 142 Parsons Ave., Columbus 15, Ohio.

—AE—

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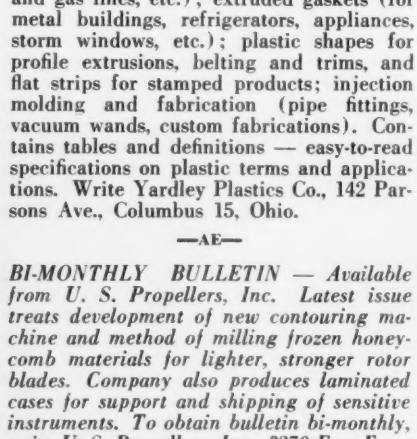
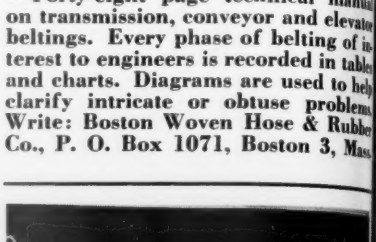


FIBERGLAS DUCT INSULATION BOOKLET—A new 16-page design data booklet for Fiberglas duct insulations has been issued by Owens-Corning Fiberglas Corporation. The booklet has more than 40 photographs and drawings of the various rigid and flexible Fiberglas insulations for the exterior and interior of warm and cold air ducts.

Included is complete information about a new flexible duct liner which may be installed on metal sheets before they are bent to form ducts. A light coating of fire-safe neoprene on liner prevents erosion by high-velocity air and reduces frictional losses. Available from Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

PORTABLE STRAIN INDICATOR — Baldwin Bulletin 4103 describes a newly improved SR—4 portable strain indicator, the Type MA, with self contained a.c. power pack mounted inside the instrument case. Copies may be obtained from Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa.

MANUAL ON INDUSTRIAL BELTING —Forty-eight page technical manual on transmission, conveyor and elevator beltings. Every phase of belting of interest to engineers is recorded in tables and charts. Diagrams are used to help clarify intricate or obtuse problems. Write: Boston Woven Hose & Rubber Co., P. O. Box 1071, Boston 3, Mass.



ELECTRICAL FITTINGS — 16 page catalog describes solderless wire connectors and specialized electrical fittings. Contains information on "pres-*SURE*-connectors" for solderless wire splicing and terminating, "Bushend" insulated bushings for electrical metallic conduit, "Snap-Action" plugs for temporary or permanent plugging of knockout holes in wiring device boxes and other applications; also heavy duty molded terminal blocks in various styles, types, and sizes. Includes complete specifications, dimensional data, application instructions. Available from Buchanan Electrical Products Corp., Hillside, New Jersey.

INDUCTION GENERATORS — Operating principles of AiResearch induction generators for aircraft and guided missiles are outlined in booklet No. EB-3-1, just published by AiResearch Manufacturing Co.

The booklet, illustrated with charts and photographs, contains design features, operating function, performance characteristics, and applications of AiResearch generators. In addition, equations are supplied to allow modification of performance characteristics. Address AiResearch Manufacturing Company, Los Angeles 45, Calif.

—AE—

CONCRETE PRODUCTS FOLDER — Illustrated are plain and reinforced concrete sewer pipe, culverts, site cast pipe, large diameter pipe, long length pipe, special pipe for carrying corrosive industrial wastes, flat base pipe, rubber gaskets, river weights, precast package bridges and concrete cribbing. Write Universal Concrete Pipe Co., 297 S. High St., Columbus, Ohio.

Letters

Shortages and Salaries . . .

Dear Editor:

Congratulations to Mr. H. Millard whose letter to the NSPE appeared in the June Illinois *Engineer* ***(Ill. SPE's magazine—*** **Ed.)** and whose pen echos the feelings of many engineers.

While our Society calls for more engineers, examination of its own salary survey indicates that an "average" engineer works at least thirty years in the profession before his accumulated earnings equal that of a Chicago electrician. Surprised?

Other professions have societies that are interested in the welfare of the members. Other professions that deal directly with our life have acute shortages that exceed even the wildest claims of those who believe in the shortage and cheap manpower industry.

If NSPE President Forrest (AMERICAN ENGINEER, August, 1953) would have us "dress as professional people" let our Society at least, counteract this shortage misinformation until we can afford to change our shirts a little more often.

I join you in your query Mr. Millard. If our Society is changing its policy, why are the members not notified?

ROBERT J. FREUND, P.E.,
Chicago, Illinois

► In Engineer Millard's letter to Society officials, he criticizes what he believes to be NSPE's policy of claiming a tremendous shortage of engineers, and trying to encourage more and more to enter the profession. For Reader Freund's information, portions of Executive Director Paul Robbin's letter to Engineer Millard are printed here:

. . . NSPE has taken the position that there is little we can do with respect to the supply of engineers. . . . The principal problem in the supply of engineers at the present time evolves from the low birth rates of the '30s and the fact that we have a limited number of high school graduates now available for college work, at the same time that there are high demands for these men by the armed services.

. . . NSPE has therefore felt that there are two fields in which the professional society can be of assistance. The first is in the *utilization* of the existing personnel *(NSPE's Second Executive Research Survey covered this field.—Ed.)* . . . The second responsibility . . . is in the field of vocational guidance. Here the emphasis has been that we should present to high school students a *factual* picture of the opportunities in engineering, the need for high qualifications, and particularly the philosophy that only those qualified and having a desire to utilize engineering training should enter the field . . . —*Editor.*

Army Misuse . . .

Dear Editor:

I read with much interest in the August edition of the AMERICAN ENGINEER, Mr. Milton F. Lunch's report "From Washington" and the "Army Acts on Engineer Utilization" by Mr. Edward J. Sloane. It is

(*Continued on page* 5)

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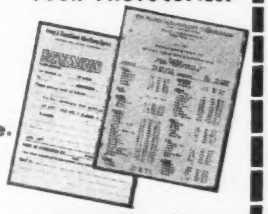

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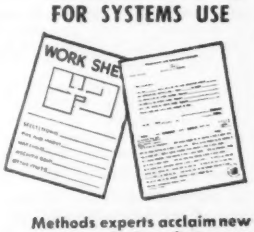

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American Engineer

SEPTEMBER, 1953

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•

He (Bernard Baruch) long ago ceased to be thought of as a partisan for any cause but the good of his country and of humanity. He has given his time, his tireless energy, his material means to help his fellow men, and he has not rested from his labors.

—New York *Times* Editorial
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Letters

(*Continued from page* 3)

a shame that the Army as a whole has not endeavored to screen its military personnel, especially its recalled Reserve Officers, to effect a better utilization of technical personnel.

I do not intend my remarks to appear as a personal gripe, but rather to present facts. I was recalled to active duty as a Reserve Officer on January 3, 1952, to serve for 2 years with the Signal Corps. At the time of recall I was Division Engineer, Texarkana Division, for the Southwestern Gas and Electric Company, Texarkana, Ark.-Tex., and registered as an Electrical Engineer in the state of Texas. Upon reporting to duty at the Signal School, Ft. Monmouth, N. J., I found that I had been selected for Supply work as the Signal Corps would not recognize my Electrical Engineering classification, due to it being in the field of Power and Lighting, rather than in Communications.

After completing a refresher course at Ft. Monmouth, N. J., and a Supply Course at Camp Holabird, Baltimore, Maryland, I was assigned on May 19, 1952 to the Signal Corps Supply Agency, Philadelphia, Pa. At present I am classified as a Supply Status Officer and performing duties which are purely Administrative, not requiring any technical background.

Only recently has the Army shown any indication of better using its technical personnel. The Corps of Engineers on July 29, 1953, published a circular requesting certain reserve personnel to volunteer for transfer to the Corps of Engineers, due to a critical shortage of Engineers. This may be the turning point the NSPE is working for.

LOVIC P. PERDUE, JR., P.E.,
Philadelphia, Pa.

Oregon Story . . .

Dear Editor:

Perhaps the hassle that has been going on over the office of County Surveyor of Multnoman County, Oregon, will interest readers of AMERICAN ENGINEER and again inasmuch as it seems that all we can do is to grin and bear it you may feel that you can use your space to better advantage otherwise.

In one section the State Constitution of Oregon, adopted in 1859, created five county offices, including that of county surveyor. A subsequent section says "No person shall be appointed or elected to such office who is not an elector of the county." This is the only statement touching on qualifications in the constitution and in 1949 the legislature, at the behest of the Professional Engineers of Oregon, passed a law requiring that a county surveyor be a licensed professional engineer or a licensed professional land surveyor.

In 1952 one candidate for the office was a duly registered land surveyor, the other had no license and, as nearly as can be ascertained, has no real knowledge or experience of land surveying. Nevertheless he was elected.

Acting on legal advice the retiring county surveyor, a professional engineer, turned the office over to the elected man and then brought suit challenging his right to hold it. The case was heard before three circuit judges sitting *en banc* and the defense was that in attaching qualifications to the office the legislature, in effect, amended the constitution which of course it had no right to do. The court ruled differently, stating that the constitutional provision was of a negative nature and simply said who could *not* be county surveyor and this did not bar the legislature from establishing positive qualifications as to who could be.

This decision was appealed and reversed by the Supreme Court which held the elected candidate to be entitled to the office. The effect of this decision is that any elector is eligible to the office of county surveyor in Oregon. Perhaps he can not sign his own name but if he is on the electoral rolls and can get the votes he is in.

An interesting angle is that this case is almost exactly parallel to the provisions covering judgeships in Oregon. The constitution establishes no qualifications other than residence. In the case of a Justice of the Supreme Court he must have been a resident of the state for at least three years prior to his election. Later the legislature enacted a statute requiring that a judge must be a member of the Oregon Bar and have practiced law a certain time in the state.

We wonder what the Supreme Court would decide if a professional engineer should manage to get elected to that august tribunal.

LEROY A. PALMER, P.E.,
Portland, O.

► Attention is directed to the news story on page 23 of this issue for the latest information on the Oregon case. —*Editor.*

Getting Top Jobs . . .

Dear Editor:

The article in the August issue by Mr. Pell appears to be a gracious attempt to tell engineers how to write better resumes and get better jobs—except for the paid advertisement that appears along with it to the effect that we should for a fee consult this personnel specialist.

The current shortage of engineers has put our profession in the *elite* class and this has provoked all kinds of extremists. There are the extremists who are constantly telling us that our engineering schools are no good. Yet we continue to see one corporation after another selecting engineers for their presidencies. There are extremists who want more philosophy, more languages, more methodology, etc., etc. Yet we continue to learn about excellent self-made engineers. Now come along the slick personnel consultants who seem to think that the time is ripe to make a killing like the slick bond salesman does with the poor rich widow.

Engineers, caveat *emptor!* Resumes do not mean a thing. You will get a better job with the competitor of your present employer when you get to be a key man in your present organization. But by that time your present employer will find it extremely uneconomical to let you go. Even if your present employer is no good at all (which is unlikely these days), you can win the remuneration you need by learning so much about his business that it will patently be uneconomical for him to let you go. But to be effective all this must be very subtly wrapped up in a great deal of excellent service, which means good hard work. There is no short cut around that.

FREDERICK MARICH,
New York, N. Y.

► The *American Engineer* has a rigid policy concerning so-called "tie-in" advertising to which Reader Marich alludes. A copy of this policy statement has been forwarded to him.—*Editor.*

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Professional News in Capsule Form

Col. Lichtenberg Receives Freedom Foundation Award • Royal Society of Edinburgh Honors Dr. Egloff • Fire Prevention Week Proclaimed by President • Army Engineers' Civil Works Appropriation Totals $421,686,600 • Other Items of Interest

Col. Chester Lichtenberg, a former NSPE vice president and now civil defense director of Fort Wayne and Allen County, Indiana, has been awarded the Freedom Foundation's George Washington Honor Medal.

The citation accompanying the medal reads in part: "His leadership and unselfishness in giving up time and money have resulted in a concrete workable civil defense institution in Fort Wayne. He has substituted common sense business methods for frustrating red tape. . . . He proceeds with a knowledge of methods of organization and fearlessness of criticism. . . . Col. Chester Lichtenberg has given generously in defense of this land of God and freedom. He has strengthened America."

The Fort Wayne civil defense plan, which was developed under the guidance of Col. Lichtenberg, has been used as a basis for CD organization in large cities throughout the country, and Col. Lichtenberg has frequently been called upon as a consultant in this regard.

* * *

Dr. Gustav Egloff, director of research for the Universal Oil Products Company, Des Plaines, Illinois, has been elected an honorary fellow of the Royal Society of Edinburgh, which was established by royal charter in 1783 for the promotion of science and literature.

Dr. Egloff, who is a prominent member of the Illinois and National Societies of Professional Engineers, was one of four outstanding persons not British subjects who have been so honored this year. The other non-Britishers who were chosen for the 1953 honors are: Professor Otto Struve, Department of Astronomy, University of California; Professor Carl Peter Henrik Dam, Polytechnic Institute, Copenhagen; and Professor Karl Manne Georg Siegbahn, a Stockholm physicist.

* * *

President Eisenhower has proclaimed October 4-10 as Fire Prevention Week for 1953 and urged the nation to wage a crusade against fires which have cost one billion dollars and 10,000 lives in the past year alone. The observance, which will include community fire prevention activities, fire-fighting demonstrations, and inspection of local fire department facilities, industrial plants, commercial buildings, homes, and schools, is sponsored by the Chamber of Commerce of the United States through its affiliated organization, the National Fire Waste Council.

* * *

The Eighty-Third Congress appropriated $421,686,600 for the civil works functions of the Corps of Engineers in the 1954 fiscal year, according to an announcement from the office of Major General Samuel D. Sturgis, Jr., Chief of Engineers.

The funds, included in the Department of the Army Civil Functions Appropriation Bill signed by the President on July 27, 1953, are allocated to construction, maintenance, planning projects and survey reports in the Congressionally authorized flood control and river and harbor improvement programs assigned to Army Engineers.

* * *

Harland Bartholomew, a new member of NSPE and the Missouri Society, has been named a member and chairman of the National Capital Planning Commission by President Eisenhower. Mr. Bartholomew, head of the St. Louis firm of Harland Bartholomew and Associates, city planners, civil engineers, and landscape architects, has been a paid consultant to the Commission since 1926 and has done planning work for approximately fifty other U. S. cities. He is a past president of the American Institute of Planners and the National Conference on City Planning.

His term as a member of the Commission will run for six years, until April 30, 1959, and he is scheduled to take over the chairmanship September 1. Mr. Bartholomew was recommended for the post by Secretary of the Interior Douglas McKay. The appointment does not require Senate confirmation.

* * *

"Meeting the Health Needs of the Community" will be the theme of the eighty-first annual convention of the American Public Health Association and the annual sessions of forty related organizations, scheduled for the Hotels Statler and New Yorker November 9-13, in New York City. Among the more than 5,000 persons expected to attend, will be many engineers engaged in work related to the public health field.

Among the special sessions of interest to engineers will be those devoted to industrial hygiene and sanitation, accident prevention, and laboratory and engineering developments.

* * *

NSPE member Dr. Carl L. Svensen of Austin, executive secretary of the Texas State Board of Registration for Professional Engineers, has won the annual service award of the engineering drawing division, American Society for Engineering Education. He was cited as "an enthusiastic teacher and administrator and one of the country's leading professional engineers and consultants."

Dr. Svensen is the author of nine books and has been secretary of the registration board since 1942. His local affiliation is with the Travis County Chapter of the Texas SPE.

* * *

William R. Benn has been elected

"Don't bother about the details . . . Just design a machine for us that will make a substitute for zippers!"

chairman of the Safety Committee of the National Constructors Association, an organization composed of engineering and building firms engaged in the design and construction of chemical plants, steel mills, and petroleum refineries.

Mr. Benn, who is a graduate of both the South Dakota School of Mines and Purdue University, is safety engineer of the H. K. Ferguson Company of Cleveland, Ohio.

* * *

The results of a survey on the "organizational position of the safety engineer in American industry" have just been made public in a booklet published by the Society for the Advancement of Management. Those participating in the survey represented a cross section of the three grades of membership of the American Society of Safety Engineers.

A total of 417 questionnaires —from 199 members, 150 associate members, and 68 junior members in 33 different industries from food processing to steelmaking — were tabulated; and statistics relating to education, experience, responsibility, and salaries were derived.

Fifty-three of the participants had salaries of over $10,000, while 57 reported annual income below $5,000. The average salary of full members (that is, those at least 30 years of age with either a degree from an accredited engineering college and eight years of safety engineering experience, or the equivalent of ten years' experience in the same field) is reported as $7,900. The median salary for the entire group studied is $6,820.

Another interesting observation highlighted in the report is that in the stronger safety programs, where the safety engineer makes his own safety policy decisions, the frequency and severity injury rates are both generally lower than in programs where policy is the result of group determination.

* * *

The August 31 retirement of Dr. Robert C. Disque, dean of the faculty and, since 1933, dean of the College of Engineering, Drexel Institute of Technology, has been announced by Dr. James Creese, Institute president. He will be succeeded in both posts by Professor Harry L. Bowman, head of the Department of Civil Engineering.

Dr. Disque, who is a member of the Pennsylvania SPE, has been named Dean Emeritus and Professor Emeritus of Electrical Engineering by the trustees of the Institute. He has been associated with Drexel since 1919.

* * *

The Fifth Congress of the International Association for Hydraulic Research is scheduled to be held jointly with the second meeting of the Hydraulics Division of the American Society of Civil Engineers, September 1st to 4th, on the campus of the University of Minnesota in Minneapolis. This is the first meeting of the International Association for Hydraulic Research on the American continent.

* * *

Dr. Eric A. Walker, dean of the Pennsylvania State College School of Engineering, stated recently that the training of atomic engineers, whose work will be essential if atomic energy ever becomes a source of civilian power, is badly handicapped by the difficulty of obtaining fissionable material for laboratory use. He also urged that information relating to the civilian application of atomic energy be taken off the secrecy list. Under present policies, he warned, the greatest engineering shortage of all may be in the atomic energy field.

Dr. Walker made his remarks while testifying before the Joint Congressional Committee on Atomic Energy shortly before the close of the first session of the Eighty-Third Congress.

* * *

The Building Research Institute has recently changed its name to the BRAB (Building Research Advisory Board) Institute with the authorization of the National Research Council with which it is affiliated.

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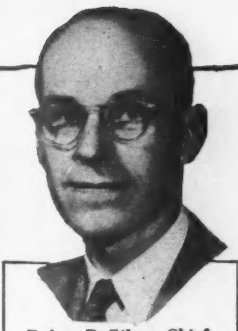

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Annual Meeting Speeches Available

One of the highlights of the 19th Annual Meeting was a symposium entitled, "Programs for Professional Advancement." The four papers in this series were:

"The Need for More Effective Professional Action," by Alex Van Praag, Jr., P.E., NSPE Past President.

"NSPE's Development of Professional Objectives," by Perry Ford, P.E. Past President.

"The Professional Development of Engineers and Scientists in Industry," by Clark Ransom, P.E., General Electric Company.

"The Place of Registration in Professional Development," by Karl B. McEachron, P.E., past chairman, Massachusetts Registration Board for Professional Engineers.

These papers have been printed in single pamphlets and are available upon request to the Washington Office, NSPE, 1121 15th St., N.W., Wash. 5, D. C. Please indicate in your order whether you desire all of the papers or certain papers only.

Editor's Note:

September is back-to-school month for thousands of young people. But, unhappily, not nearly enough of them will be entering the Schools of Engineering across the land. This is not a good thing for the profession; indeed, it is not a good thing for the nation. The *American Engineer* asked the very busy Herbert Hoover, our most distinguished living engineer, to comment briefly on this situation. He wrote as follows . .

Future Bright for Engineers—H. Hoover

TODAY the United States is not only short of engineers, but the attendance in our technical institutions indicates an even greater shortage for the future.

Therefore, every young engineer can get a job. And it is a job of lifelong productive work. The engineer's profession is a unique field in which discoveries of pure science are applied to human comfort and national progress. While his requirements are difficult, yet his is a life of satisfaction in creative accomplishment.

Never was there a brighter future before the profession.

Herbert Hoover

Former President Herbert Hoover talks with President Eisenhower at the White House at a meeting at which Hoover agreed to accept chairmanship of a commission to study needed revision of government machinery.

NEEDED: A SURE SENSE OF VALUES

By

BERNARD BARUCH,

Noted Financier and Presidential Adviser

Have Technological Advancements Seriously Shaken Our Faith in the Certainty of Progress? Have We Forgotten How to Think and, Therefore, How to Solve our Problems? Read This Analysis of Today's World By One of Our Leading Citizens.

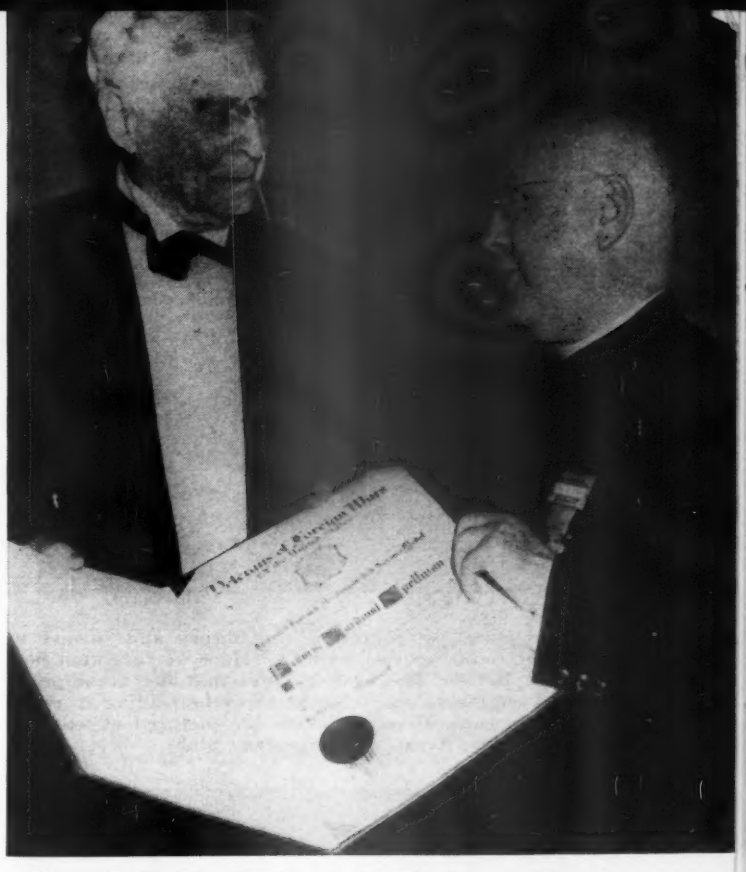
MORE than sixty years have passed since I was a college student. There were virtually no elective courses then. I studied Latin and Greek for the first four years and French in the fifth and last year. Politics, economics, logic, ethics, philosophy and psychology were taught as parts of a single course.

How infinitely more varied are the curricula today! Yet today's young people would do well to ask themselves whether they are better educated because of this enriched curricula.

That question, phrased somewhat differently, can be applied to the whole of our civilization. Think how enriched our daily curricula of living have become by the many new engineering and scientific developments which weren't even known sixty-odd years ago—like the automobile, airplane, television, antibiotics, and so on. But this same half century or more which has brought such astonishing material advances has been marked by two terrible world wars and by a revival of ancient tyrannies, made all the more barbaric through being technologically refined.

When I was a young man we took for granted that all nations were evolving steadily towards a better life and increased freedom for the individual. That simple faith in the certainty of progress is gone. In this twentieth century we have sniffed the horrible stench of gas chambers; we have seen the return of slavery as a human institution, both in Germany under Hitler and behind the Iron Curtain.

Why is it that we perform miracles almost daily in our laboratories but fumble like children when governing ourselves?



Bernard M. Baruch, internationally known financier and presidential adviser, presents the Veterans of Foreign Wars' Baruch Award to Francis Cardinal Spellman, Roman Catholic Archbishop of New York.

Is it not largely because we are so poorly educated?

Mind you, I do not set up my own generation as a model. Perhaps what I am driving at can best be illustrated by going back to the writing of the Constitution.

THE men who framed the Constitution would not today be called a highly educated group, by academic standards. There was not a professor of government among them. Benjamin Franklin had only three years of formal schooling. George Washington was tutored in Latin until he was fourteen and later taught himself mathematics. James Madison was one of the few college graduates there. I daresay that most of the men who drafted the Constitution could not have met the entrance requirements of our schools today.

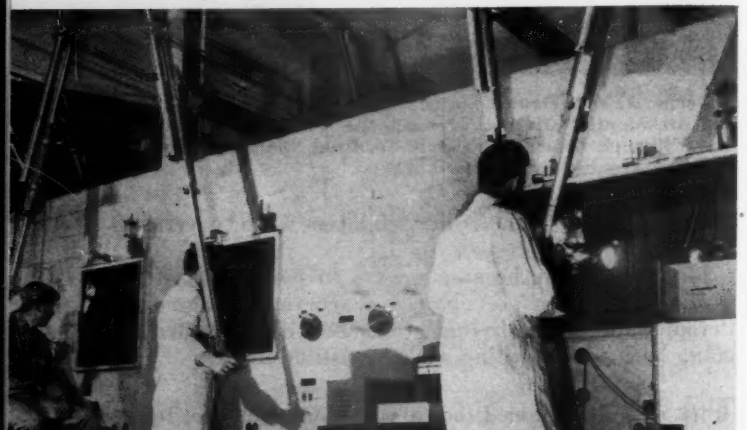
Still, despite their lack of formal education, the men who met in Philadelphia in 1787 were well-educated in the true meaning of the term. First, and most important, they knew how to think.

Second, although they lacked access to the well-stocked libraries so common today, they were well-read in the classics, and had learned how to blend living experience with the lessons of history. They had also studied those pioneering works of political philosophy which appeared in the 18th Century. From Montesquieu's *Spirit of the Laws*, for example, they drew the concept of separating the executive, legislative and judicial powers, fitting it into the American experience in a novel way.

The fathers of our country were well-educated in still another sense—they were deeply imbued with moral values. Their minds drew a clear distinction between good and evil, between principle and expediency. They were not uncertain of the values they believed in and were determined to uphold.

Being thoroughly practical men, they made their com-

Above: Have we forgotten the library and turned to magazines, radio, movies, and TV? Have we forgotten how to *think?* Below: The author fears that the accomplishments of engineers and scientists may be leading us down the path to ruin. Here engineers are pictured at work in the Oak Ridge, Tenn. atomic energy plant.



promises, or "deals" if you prefer that word, in order to come to agreement. But they embedded the basic structure of our government in a foundation of rock-like principles. If the American mansion they erected was thoroughly habitable in terms of their own times, it also had a majestic grandeur that would enable it to endure for ages to come.

Today, in contrast, thinking has become a generally neglected art. Although we read prodigiously, we seem to have lost the faculty of learning from the past. We lack any sure sense of values.

NEVER before in history has mankind boasted superior means of communication, high speed printing presses, profusely illustrated magazines, the radio, movies, television. Yet all these miraculous forms of communication that engineers and scientists have given us seem less conducive to thought than a log in the woods.

Almost, in fact, these jet-propelled, streamlined means of communication appear the enemies of thinking. They bombard us daily with fresh distractions and new alarums. The net result is that our energies—not only our intellectual energies but our economic and military resources—are dissipated on side issues, while the fundamentals of the critical problems before us remain untouched and ignored.

Not too long ago, it was fondly thought that ours was "The Age of Enlightenment." More and more it is becoming "The Age of Distraction."

The failure of our educational institutions to teach the know-how of thinking cuts to the core of the raging controversy over so-called "subversive" influences in our schools. There would be no problem in teaching our students about communism, about Buddhism, or about any other subject, if the students had learned how to think, how to organize all the many aspects of a problem so it could be seen in the whole and free of both bitterness and wishful thinking, how not to fall victim to labels which had one meaning many years ago and cannot possibly mean the same thing today.

Some people, for example, seek to picture the Soviet system as the outgrowth of the "liberal" tradition. Those who know how to use their minds properly will readily recognize the Soviet system for what it is—a reversion to the barbarism of the dark ages against which "liberalism" revolted.

All the apparatus of medievalism is present in Russia today—the inquisition, the Bastilles in which men and women are imprisioned without knowing the charges levelled against them, the resort to terrorism and scapegoats as governmental policy.

When the dogma of the divine rights of kings was overthrown it was a crucial liberal victory, proclaiming a new faith in man's ability to govern himself. The Soviets have reasserted the ancient dogma that the people are not to be trusted to manage their own affairs but must be dictated to by a self-annointed elite which claims to know it all.

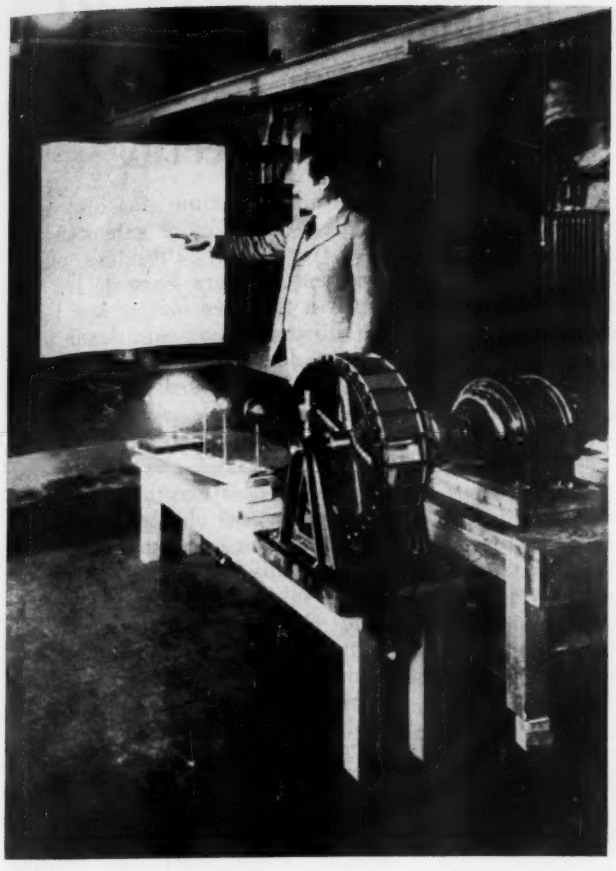
FOR our own part, whatever may come of the current Soviet "peace" maneuvers, we will benefit if they cause us to think through our position on all of the many problems of the peacemaking. For some time now we have followed a policy of drift—flinging together hasty actions to meet each crisis as it arose, but never organizing ourselves to anticipate what lay ahead.

We must know on what terms and conditions it would be safe to settle, where it might be wise to compromise, where we must stand firm. Since at best only a guarded settlement is possible, we must also think through the interrelationships of the various questions we face in different parts of the world. The problems of Asia and Europe, of South America and Africa, of disarmament and threatened agression, of taxes and military readiness—these and other problems—must all be brought together into a world-wide balance.

Of the many things that must be thought through to achieve this world-wide balance, none is more important than the relationship of peace and freedom. Sometimes the two seems synonymous. Certainly war, with its totalitarian demands, is the very opposite of freedom.

And yet, if war is to be prevented we must know when to accept the infringements upon individual freedom which are necessary so we can mobilize our power in time. The strength of a free society does not lie in the blind tenacity with which its members cling to their own individual rights. The strength of a free society will be found in the common disciplines that free men accept to preserve that society.

Nor is it only in terms of war that we must understand the true meaning of the word "freedom." Woodrow Wilson once wrote "liberty in itself is not government. In the wrong hands, in the hands of the unpracticed and undisciplined, it is incompatible with government." The proper function of government is to regulate society so that each



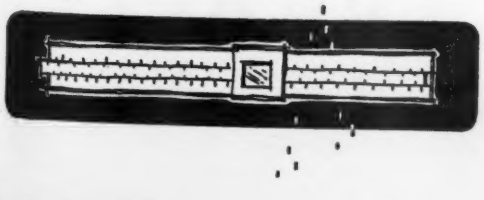
Dr. Alexanderson and his first television transmitter. Each of the 24 mirrors mounted on the wheel of the machine was set at a different angle. Seven distinct light sources were used, each painting a crude picture of the image televised before seven photo cells. TV has since become one of our leading means of communication.

person is able to develop to the fullest his or her own mortal potentialities.

OVER the last half century or more, our hopes for a better world have revolved mainly around material advances. We have pressed this technological quest to the point where nothing seems beyond man's capacity — nothing physical or material, that is. We can, thanks largely to the engineering profession, level mountains, irrigate deserts, fly faster than the speed of sound.

Reflecting this rage for technological advance, our colleges and universities have tended more and more to emphasize technical skill rather than thinking ability. It is gratifying to know, of course, that the engineering profession is working closely with educators in the hope that future students will receive more studies in the humanities. Indeed, some leading engineering schools have already extended their courses of study to five-years in order to accomplish this. But more must be done, for where has this race for technical progress alone brought us?

It has brought us to where we live in fear that this incredible energy at man's command will become the means of destroying civilization as we know it.



Clearly something is missing. That something can hardly be still more power, still newer technological advances. The something we lack is discipline, the capacity to govern ourselves and to control the power that is already ours. And does not the essential failure of modern education lie in the fact that it has forgotten this age-old truth, that man is free only when his power and knowledge are properly disciplined?

The outcome of the cold war is likely to hinge upon our recognizing—or failing to recognize—this truth. Our struggle with the Soviets is often pictured as ranging the forces of freedom against the forces of tyranny. If only the choice were that simple—there would be no uncertainty of the outcome.

BUT when it comes to carrying out any program made necessary by the cold war, we find that it invariably requires subordinating personal interests to the national interest. Invariably it calls for giving up something to preserve the freedom we cherish.

The choice we face is not, then, one of freedom versus slavery. Our choice is between the freedom to discipline ourselves and the slavery that others would impose upon us.

Should we fail to discipline ourselves, we can be sure that the enemy will forge the shackles of biting iron which will discipline us only too well—and for only too long.

WHEN the men who wrote the Declaration of Independence came to define what they considered man's inalienable rights, they chose their words carefully—"life, liberty and the pursuit of happiness!" Not "happiness," but "the pursuit of happiness." They made no promoises of utopia —they promised only the *opportunity* to better one's living.

From time to time men arise who do promise utopia—if one will only put oneself in their hands to be done with as they please. So speak the goldbrick salesmen. So speak dictators.—***End.***

The Author . . .

Mr. Baruch

Bernard Mannes Baruch — financier, adviser to Presidents, and respected elder statesman — scarcely needs any formal biographical introduction, so familiar has the record of his accomplishments, both as a member of the New York Stock Exchange and as an outstanding public servant, become throughout the world.

Born in 1870, the son of Simon and Belle Baruch, the future leader received his A.B. from the College of the City of New York when he was only nineteen and then embarked on his singularly successful and spectacular career.

He gave yeoman service to the country during both World Wars. In 1916, President Wilson appointed him to the Advisory Commission of the Council of National Defense; and later he became chairman of the Committee on Raw Materials, Minerals and Metals, and then of the War Industries Board. At the conclusion of World War I, he served as an American delegate on economics and reparations clauses and as economic adviser for the American Peace Commission. During World War II, he was named head of a fact-finding committee on synthetic rubber and he acted as a special adviser to War Mobilization Director James F. Byrnes from 1943.

Mr. Baruch has also served the Government in various capacities in peacetime. In 1946, he was U. S. representative on the U. N. Atomic Energy Commission. He is known as an author, particularly in the field of economics, and he has been honored with degrees from many leading educational institutions.

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Headquarters Housing, Enlarged 1954 Program, Leading Items on Executive Committee Agenda at D. C. Meeting

Making plans for a future home for a growing NSPE was the leading topic for discussion at the August 22-24 meeting of the Society's Executive Committee in Washington, D. C. Also in attendance at early sessions was a group of Advisors on Headquarters Housing including Society Treasurer Russell B. Allen, Oscar H. Beasley, and Past Presidents S. L. Stolte and Ritchie Lawrie, Jr.

The group visited several prospective building and rental sites in the metropolitan area of Washington, as well as existing structures that might serve as future housing for the expanding Society. A final decision was not made pending a full report to the Board of Directors at their fall meeting in Indianapolis.

Considerable time was also spent planning for a more extensive program for 1954. Presiding officer, President T. Carr Forrest, Jr., presented a tentative budget and list of activities based on additional funds to be made available through the dues increase. This called for more work to be done in such fields as public relations, chapter activities, membership and legislation, as well as an increase in general meetings.

Attention was also given the third Executive Research Survey report to be issued this fall. The report, a study of the subject "How to Attract and Hold Engineering Talent," will be written following the receipt of information gathered from questionnaires already sent to leading industrial employers and employees.

Plans for National Engineers' Week, 1954, were covered by the executive group. The contents of the Promotional Kit to be issued to State Societies and Chapters were reviewed.

(EDITOR'S NOTE: *All those desiring to list their meetings under Dates to Remember should send* COMPLETE *information, including date and place, directly to the American Engineer.*)

New Jersey Society of Professional Engineers — Semi-annual Meeting and Shore Dinner, September 12. Old Orchard Country Club, Eatontown, New Jersey.

Wisconsin Society of Professional Engineers—Seventh Annual Summer Meeting, September 18, 19. Schwartz Resort Hotel, Elkhart, Wisconsin.

West Virginia Society of Professional Engineers—Annual Meeting, September 25, 26. Daniel Boone Hotel, Charleston, West Virginia.

Missouri Society of Professional Engineers—Annual Meeting, October 16, 17. Tiger Hotel, Columbia, Missouri.

National Council of State Boards of Engineering Examiners—Annual Meeting, October 29, 30, 31. Plaza Hotel, San Antonio, Texas.

NSPE Board of Directors Meeting—November 6, 7. Severin Hotel, Indianapolis, Indiana.

FOR CONTRACTORS . . .

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DESIGN FACTORS IN ENGINEERING UNITY

By Clarence T. Shoch, P.E.

Vice President, Northeastern Region, NSPE

Where Is the Profession In What the Author Calls the "Search for Unity"? How Should a "Unity Group" Function?

"NECESSITY is the Mother of Invention." To engineers, accustomed as they are to carrying on their work under various admonitions, that saying should provide constant hope for success in their search for "unity." Worthy objectives must be held firmly despite problems met on the way, those problems in this instance growing out of the many branches of the engineering profession and the diverse interests of its members.

Various groups in all walks of life are, today, rendering a fuller public service, and profiting generally themselves, from a pooling of certain of their interests. This is in keeping with the wisdom of the formula established by the Continental Congress, which brought into concert the efforts of many States without seriously impairing the rights of any. Bringing together functions that are truly in the common interest will make for a strong over-all unit, and strengthen the components as well. However, this will be true only if care is taken not to have the over-all unit overstep the field of practical joint activities.

Although there are continuing needs for a unity organization to speak for engineers generally, actually, the importance of these needs rises and falls as circumstances change. A recent instance of great need for an organization to speak for engineers came during the years of war when the Army decided on an educational program to train engineers. Without consulting the engineers, a two-year program was established. Experienced engineers were called in and helped implement the program. A similar speed-up was tried in medicine, but the American Medical Association insisted that it would not dilute its program. Whereupon, the Army agreed on the regular setup normally required for medical education. Specific needs vary in both type and importance. Others of a general nature are constantly with us.

The role assumed by a unity organization must necessarily be a step-by-step development. At the moment there appears to be but a limited number of fields of activity where the present individual societies and associations might feel free to relinquish their present efforts to an over-all group. Among these activities are the following four which perhaps constitute as much a field as should be undertaken initially by a unity organization.

1. **Public Relations**—With programs of information on engineering accomplishments and with particular emphasis on the opportunities for those in the engineering profession to interest themselves in public service.

2. **Employment Relations**—With particular emphasis on the interrelated responsibilities of the engineer and employer, with regard to "professional economics" and the matter of union membership.

3. **Professional Development** — With respect to progress through education and ethical practices, including the need for, and uniformity of, registration requirements.

4. **Legislation**—With concern for national or area-wide developments affecting any phase of the engineering profession.

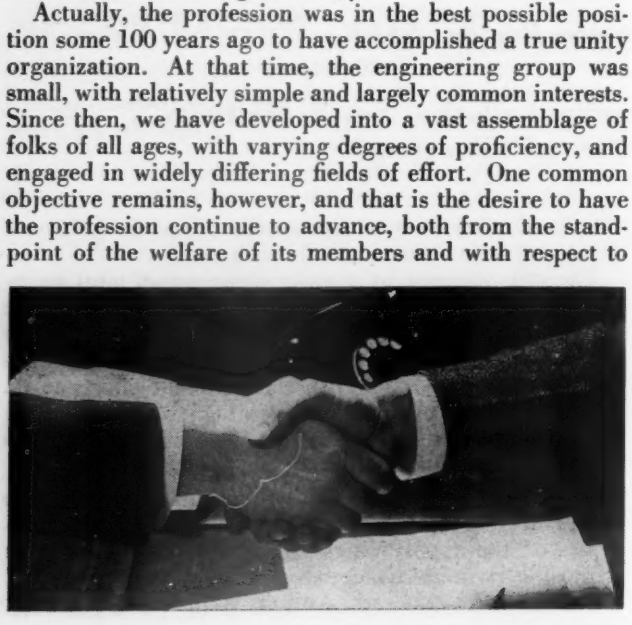
While it may be immediately apparent that the above fields can be properly developed for the common good, it should be equally evident that a unity organization should not concern itself with the specialty fields of the technical groups (or any federation thereof) which deal largely in matters of developing and exchanging informa-

It took unity of purpose for engineers to conceive and build the beautiful San Francisco-Oakland Bay Bridge. Can they achieve as much in their professional activities?

tion on technical methods, standards and codes.

With the above introductory remarks serving as a tempering background for more specific considerations, we shall pose some of the current factors that must be considered in the design for unity.

Actually, the profession was in the best possible position some 100 years ago to have accomplished a true unity organization. At that time, the engineering group was small, with relatively simple and largely common interests. Since then, we have developed into a vast assemblage of folks of all ages, with varying degrees of proficiency, and engaged in widely differing fields of effort. One common objective remains, however, and that is the desire to have the profession continue to advance, both from the standpoint of the welfare of its members and with respect to



its contributions to public welfare. An appreciation of the fact that fragmentation or splintering of the profession is still going on, and our individual and technical society activities and interests are becoming more and more diverse, is all the emphasis we need that there is no better time than *now* to become united.

THE complexity of the unity problem, as indicated by the fact that no satisfactory unity answer has yet been forthcoming, despite attention over many years by many of the best engineering minds in the country, dictates the necessity for first reviewing certain fundamentals in the situation before attempting to arrive at an over-all design. When we speak of "unity in the engineering profession" there naturally comes to mind the need for some discussion of both the terms "unity" and "engineering profession." With respect to unity, we are well aware in this country of the effectiveness of group action. Our country first adopted a unity approach out of political and economic necessity, found it effective through all types of social situations, and fully expects that new opportunities and responsibilities will result from such group action. Group activities have become the pattern in every facet of business and social activity of the nation. By such cooperative effort we have advanced our standards of living and our position among other nations further and faster than any other peoples of the world. Thus, "unity" means to us fast, effective action through the coordinated efforts of groups.

The term "engineering profession" as it applies to the engineer's work of making the forces and substances of nature usable for and by mankind, means the coordinated over-all effort of all of the members of that profession to assure the greatest possible collective contribution in behalf of public welfare. This means that to carry one's share of work in professional activity, first consideration must be given to the over-all good, with selfish interests distinctly secondary. It is this lack of appreciation for the nullifying effect of self-interest, and the unwillingness to discontinue self-interest as a primary motive, that makes the accomplishment of unified effort in the profession of engineering such a difficult task.

AT the risk of being elementary and therefore repetitious, here are a few of the reasons why unification of the engineering profession is necessary:

1. The members of the profession need common objectives (rallying points) which can be determined only after the various branches have given considered thought to the inter-related problems.
2. A way must be found to get these objectives into action, adequately stated to the members and to the public, with proper timing for maximum effectiveness.
3. An avenue must be established for quick, effective response of member opinions as social (considered in the broad sense, including also economic and political) problems arise requiring prompt, decisive action.

Having once provided for effective group action, there should be complete discontinuance of activity by subgroups contrary to the over-all general objectives and means of accomplishment.

In developing the type of organization needed in the situation, certain peculiarities of the opportunities created, the work involved and the work status of members of the profession must be considered. In the engineering profession, for example, most of the members are employed in industry, with substantial employment also in Government, in educational institutions and in private consulting firms. There are also many self-employed, that is, operating their own consulting engineering businesses. While the work of all these groups affects the public directly or indirectly, the vast majority of the members of the engineering profession perform at considerably more than arm's-length with those who will benefit from their contributions. For example, the engineer in industry working on the research, design, production or application of a product for ultimate consumption is many times removed from the consumer. For this reason the engineer seldom gains the full appreciation of the consumers for the part he has played in the development of the product or the service to which the public is beneficiary.

Certainly the lack of direct service to the public, except for the cases where a consulting engineer has direct dealings with his client, is a tremendous obstacle to be overcome in bringing about a public realization and appreciation of the contributions of the profession. An overall public relations program is needed to tie together and promote the significance of the many kinds of professional employment.

Also prevalent in the engineering profession to a much greater degree than in any other profession is the variation in the type of work done by engineers. Not only is the work divided into major branches as, for example, civil, mechanical, electrical, etc., but the activities of engineers in those branches range all the way from the studies and tests of pure scientific research, including teaching at the college level, through the manifold phases of design, into the multitudinous facets of production, to the myriad of application problems. Also, there is a wide range of administrative and executive responsibility among engineers, the members of the profession working at greatly differing levels as they progress from a newly-established status to eminence brought about by application and experience in the problems.

The tendency of labor laws to segregate engineering personnel even further is another substantial handicap to effective group action. Here, too, a public relations program would help by evaluating engineering accomplishments in terms of public need. An employment relations program would smooth the way for increased work contribution; a professional development program would

make that work more valuable, and a legislative program would help avoid interference with professional effort.

What type of organization is needed to weld together the differing activities and viewpoints of the many branches of engineering into an effective, fast-moving front in the social field? A great deal of value in determining the type of unity organization to be set up now can be obtained by a review of professional engineering organizations over a great many years. Practically every conceivable type of organization has already been tried, and the rise and fall of the various types speak for the short-lived usefulness of those in which there was not a substantial grass roots interest.

The technical societies and similar groups, including federated groups having constituent members, have been in existence somewhat over a hundred years. The activities of these societies and groups have resulted in marked progress in education and development within the technological fields. Their members have been satisfied, by and large, to permit the policies and operations within their group to be run by those who have demonstrated competence in the type of matters normally considered. After all, technological development is pretty much a factual progression and the members are willing to accept their leaders' decisions as representing the best possible considered judgment, and very likely the same as their own decisions would have been, had they had equal training and experience.

Such handling results in a satisfactory situation so far as purely technical matters are concerned but when the status of either the profession or the individual is the subject of consideration, the members wish to have a more direct voice in the determination of policy. Inasmuch as the unification of the engineering profession is needed largely from the professional standpoint, involving almost exclusively the personal attitudes and wishes of the members with respect to non-technical matters, the group wishes to have an opportunity to discuss these matters and arrive at judgments on the basis of majority thinking. Out of respect to the personal nature of the problems encountered, means for coordinated expression and action by individuals must be found. It is imperative, therefore, that unity of the profession to provide an effective, fast-moving front in professional matters must be based upon a plan and resultant action originating with individuals as a common source, and answerable to those same individuals. In other words, a practical application of our national plan of democratic government.

MANY of the problems facing unity action have regional or sectional flavor growing out of local conditions, just as do the problems of our national Government. It is true in engineering as in the national situation, that some of these problems cross regional lines as distinct from state lines, and therefore might be handled by groups of greater scope than covered by state organizations. However, since the mechanics by which we achieve social progress are to such a large extent circumscribed by state and local laws and regulations it becomes necessary, out of a sheer realization of the practicalities in the situation, to pattern an over-all unity organization along the lines of national, state and local jurisdiction.

An organization of the type described would have individual membership at the local level to furnish the necessary, substantial grass roots base for determining policy and demanding effective action. The members would pay individual dues, directly to the organization. The direct communication possible from individuals through their local groups to a state group, and thence to a national group, provides the triple approach needed for the consideration of problems at all three important levels of government. The country-wide organization resulting from such grouping permits a fast approach when problems arise at the national level, or at the state level, for obtaining suggestions or opinions of individual members on problems affecting them personally.

The organization must be built in such a manner that it has power to act, and while doing so it shall be expressing the collective will of individual members. The top level or action end of the unity organization must be acting and speaking the will of the members.

One particularly perplexing problem facing a unity organization, however constituted, is that of establishing qualifications for membership. Of the presently effective criteria, registration as a professional engineer by a state board is one requisite, semi-formal qualification as to education, training, experience and responsibility is another. Of the 525,000 "engineers" in the country, only some 175,000 are registered, which some feel immediately limits the possibility of over-all representation so long as registration is the basic requirement. On the other hand, it is estimated that about 75% of the younger men become registered as they accumulate the experience and responsibility necessary for registration, so that time alone may resolve the situation to a point where the registration requirement would not be overly restrictive.

SINCE registration is not a necessity for many types of engineer employment in many states, proposals have been made that NSPE should give consideration to accepting on an equal basis those engineers who have had the education, training, experience and responsibility equivalent to that required for registration. However, despite the availability of qualification standards for engineers as established by ECPD and others, the difficulty here becomes one of setting up and administering the mechanics by which such equivalent determination is made.

A serious effort at unity would be needed if only to halt the stratifying influences now at work among engineers. While undoubtedly further breakdowns in the technical aspects of the profession will result from further specialized knowledge, these segregations need not carry over into the avenues of common interest that seem to hold regardless of specialization. Engineers may be progressing through ever deepening and narrowing channels of specialized development but their responsibilities to their fellow engineers and to the public remain universal.

It would be a mistake, of course, for us to assume that organization solves all problems. To be sure, organization is a useful tool, but its effectiveness depends entirely on those responsible for its programming and resultant activity. Therefore, the individuals selected to run an organization are fully as important as the organization itself. Some of the obstacles that must be coped with in forming a unity organization where policies and practices would be directed by volunteers are the availability of competent men, their geographical location, the extent of their specialized interest and, most unfortunately, politics.

The job our unity leaders will have will require first a clear vision of the goal of the profession as a whole. Along with the broad perception such vision entails will be needed an understanding of the potential contributions of each segment of the unity organization. Integrity, tolerance and patience must be present in large measures as groups with special interests have difficulty in adjusting to a pattern of broader interest and activity. At the same time we are specifying qualifications for our leaders, we as individual members of the profession must realize that it will be our expressed trust and confidence in their efforts that will make for a strong, lasting over-all unit.—***End.***

• *An American Engineer Photo Story* •

Puerto Rico's New Rum Plant

If the sight of a daiquiri or a tall, cool rum collins, brings visions of straw-hatted peons feeding sugar cane into ancient hand-turned rollers, you are going to have to revise your daydreams. Whatever the seventeenth century methods of rum-making may have been, today it takes engineering to support one of our Southern neighbor's greatest industries.

Witness to this is the new, ultramodern Rum Pilot Plant recently dedicated in rural Rio Piedras on the farm grounds of the University of Puerto Rico's Agricultural Experiment Station. The new plant, which represents a $500,000 investment by the insular government, is an attractive three story building finished in plastered cement and clay tiles. Horizontal lines created by an almost continous series of plain windows are broken near the east wing by a six-story tower. Faced with red clay tile, the tower houses four continuous column-type stills used to produce the dry, light-bodied rum for which Puerto Rico is famous.

Sparking a new era in scientific rum research, the experimental distillery has a production capacity of 150 proof gallons of rum per day. The distilling unit itself was designed and installed by Arthur D. Little, Inc., a research and engineering firm of Cambridge, Massachusetts.

Many of the Pilot Plant's facilities are unique in the distillation field. For instance, with the newly-engineered distillery unit it is possible to draw off samples of the product for testing purposes from sampling cocks at certain points of the distillation columns.

Another feature, a major contribution to the utility of the unit, is the use of a graphic panel on which a simplified flow-sheet of the distillation operation is reproduced in color to disinguish process units, the types of process and utility lines.

Instruments to indicate process variables are incorporated at the point on the control panel which corresponds to the point of measurement in the plant. Two kinds of flow-rate instruments are used—orifice meters where the flow is adequate and rotometers with manual control valves where the flow rates are too small for practicial automatic control.

Items shown on the graphic panel include the three fractionation columns, the fusel oil (bad liquor) extraction column, and all condensers, heat exchangers, and pumps. The various units are connected to indicate the piping actually installed in the plant, and a different color code is used for each type of pipe.

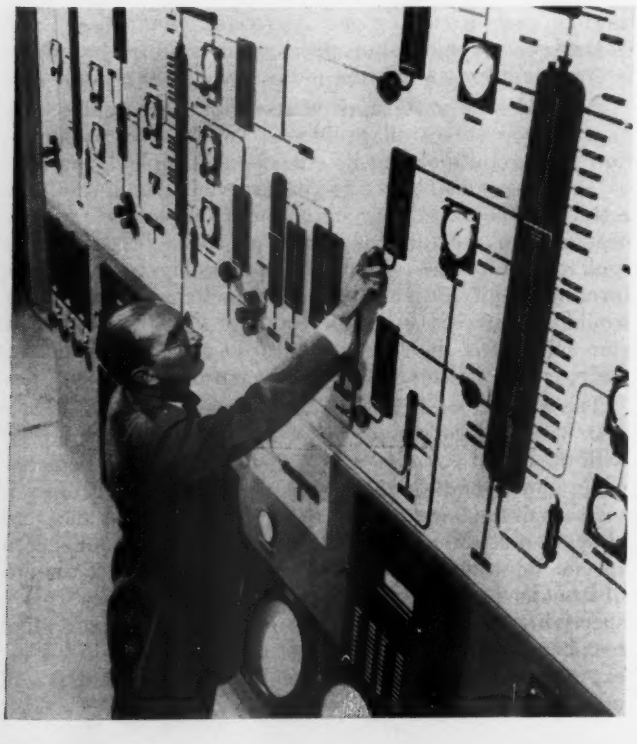
Construction of the Pilot Plant has been the most ambitious step to date in the island's comprehensive rum research program which was inaugurated by the Puerto Rican authorities in 1947 to rehabilitate the important industry in the wake of the rum market's collapse during the war years.

The exacting and lengthy preliminary planning that went into each aspect of the new plant's design points up the fact that rum is a vital industry in the Puerto Rican economy. Its development is closely tied to the well-being of the island's sugar industry since sugar cane molasses is the basic ingredient used in the manufacture of Puerto Rican rums.

An indication of what rum production means to the island is the report that during a recent four-year period the total rum revenues and taxes payable to the Puerto Rican Government amounted to approximately 215 million dollars. This income made it possible to allocate around 90 million dollars for education, 50 million for health services and construction of hospitals, 40 million for industrial development, 25 million for development of hydro-electric power, 18 million for agricultural agencies, 15 million for road building, 8 million for the expansion of aqueduct service, 5 million for the coffee crop, and other substantial amounts for public works and social services.

Victor Rodriguez Benitez, technical director of the new Pilot Plant, emphasizes that the over-all aim of its work will be to assist rum manufacturers in solving their technical problems. The information obtained through the research program will be made freely available to members of the rum industry; but no effort will be made to translate recommendations deriving from Pilot Plant activities into law, or to dictate production techniques to the distillers—although one of the plant's functions will be the analysis of rum samples submitted by the manufacturers.

The director points out, however, that the research project is in line with the rigid Quality Control Law established by the insular government, one of the stipulations of which controls the minimum age of all rum shipped from Puerto Rico. No other rum-producing country, he says, offers



Technical Director, Victor Rodriguez Benitez, at the Control Board—the "master key of modern science"—of the rum pilot plant. Each indicator controls a separate operation of the entire process of rum distillation.

such a government-insured, minimum-age guarantee to the consumer.

In addition to the experimental distillery, the new building brings together under one roof three separate laboratories for chemical, bacteriological, and distillatory research, plus a department of statistical research and a finance department for cost analysis.

Pre-treatment of molasses, an important factor in the final quality of the rums produced, will be thoroughly examined at the plant, while studies of pure culture yeasts which are used to initiate fermentation, as well as investigations of new yeast strains, will constitute the major undertaking of the bacteriological laboratory.

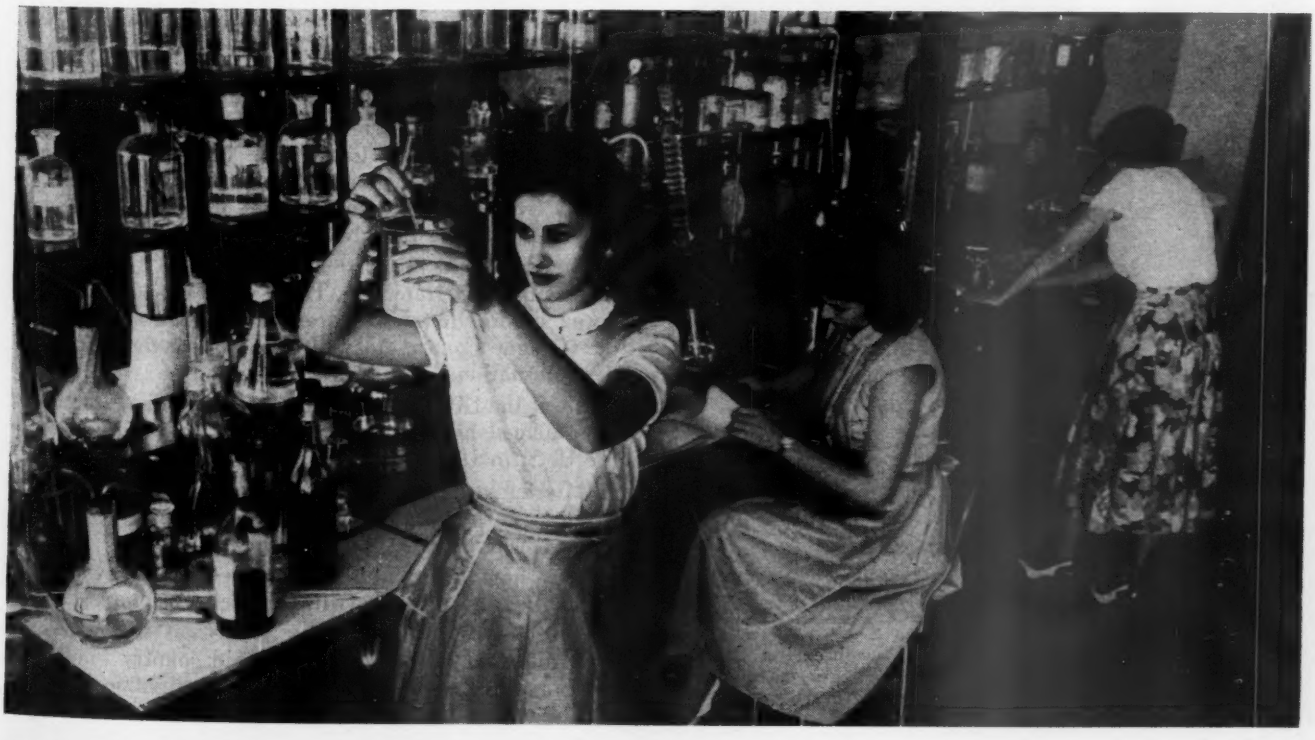
New research horizons will also be opened with the inauguration of investigations into uses for distillery by-products, as it is considered possible, for instance, that waste material obtained from the fermentation mash after its distillation may be potentially useful as a cattle feed or fertilizer. The processes for the preparation from alcohol of such products as liqueurs, gin, perfumes, eau de colognes, and antifreeze and ethyl alcohol derivatives are also among the subjects to be examined in the comprehensive research program now under way.

Commenting upon the new facility, Earl P. Stevenson, president of Arthur D. Little, Inc., the distillery designers, has stated that, "The long and careful planning put into the Rum Pilot Plant emphasizes the importance attached to rum production as Puerto Rico's second most important industry. . . . This distillery, unique and highly flexible, was designed to fit the specialized yet versatile requirements of the Puerto Rican Government's extensive rum research program. We are gratified that our engineers were asked to assist in this significant research project—a keystone in the current expansion of Puerto Rican industry."

There is one phase of operations, however, that engineering hasn't yet been able to reduce to a question of mechanics or control by a series of meters and levers and push buttons. In due recognition of this, the new Pilot Plant also includes a large taste-testing room just off a sunny terrace where the connoisseurs can meet to give their final, personal approval to the improved, "engineered" rums.—***End.***

▲ **The new rum pilot plant—a division of the Agricultural Experiment Station of the University of Puerto Rico. In this stream-lined building every phase of the insular Government's Rum Research Program now will be carried on. Its outstanding feature is an experimental rum distillery with facilities unique in the distillation field.**

▼ **Shown is a section of the analytical chemistry laboratory used in rum quality appraisal. From left to right: Misses Judith Rosso, Belen Camacho and Nelly Ramirez. All three are research assistants with Bachelor of Science degrees.**



Forced to Flee Homeland . . .

Estonian Receives Degree in 2½ Years

A 24-YEAR-OLD Colorado Agricultural & Mechanical College student accomplished something last summer that few others have done—having achieved with honors a college engineering degree in two and one-half years. He is Raoul Pettai, a serious-minded displaced person from war-torn Estonia who received his well-earned degree in electrical engineering.

A talented musician as well as a brilliant student, Pettai has been described by members of the music department at A & M as one of the state's finest violinist. He has studied music since he was a youth of seven.

Besides finding time to perform in the Fort Collins Civic Symphony, Pettai is also a member of two scholastic honoraries at A & M and was recently named the recipient of the College's coveted "Honor Engineer" Award—a yearly presentation to the top engineering student.

He graduated in the short two-and-one-half-year period with a virtual straight "A" average by studying continuously in the summers and doubling up on courses offered during the regular school year.

But to the scholarly Pettai, doing more than one thing in a stepped-up manner is not an uncommon event. He first began "hurrying" toward his new life in America nearly 10 years ago when he was forced to flee his homeland following an exchange of Russian and German occupations from 1940 to 1944.

Stripped of virtually all civil rights during this period, Pettai and his parents "escaped" to Germany when the Russians staged a counter-offensive into Nazi occupied Estonia late in the war.

Raoul Pettai received his electrical engineering degree last summer from Colorado A & M College. He was recently named the recipient of the school's "Honor Engineer" Award.

Earlier, Pettai and his family had seen their native country and home city of Tartu wilt before the merciless occupation of a superior Red army that executed nearly 70,000 Estonians from mid-1940 to 1941.

Pettai recalled that in one night alone Red troops disposed of more than 10,000 political prisoners through mass murders and deportation to Siberia. "The whole idea was to destroy the backbone of our nation by eliminating the top government officials," he explained.

Recounting the long and traditional hatred existing between the two nations, Pettai said many thousands of other Estonian officials "just disappeared" soon after opening their doors to Red militia. But later in 1941, the Russians themselves were driven out when the unchecked German offensive rolled into the country.

It was during this Nazi surge that the retreating Russians—to spite the jubilant Estonians—subjected the historic city of Tartu to a relentless artillery barrage. The action completely destroyed the Pettai home.

Although life was still far from normal under the German domination, the young student is convinced he and his countrymen lived a somewhat easier and unrestricted existence during the Nazi regime. "At least we were given liberty from the Russian terror and didn't have to worry about suddenly disappearing during the night."

In the Fort Collins home of Mr. and Mrs. L. L. Osborn, where he lived while completing his engineering studies, Pettai said, "It's an unfortunate fact that most of the brutalities in the war were done by the Russians and not the Germans. But discussing continuously what the Germans have done has made us forget what the Russians did."

Pettai and the family left the country with thousands of others at the close of the war when the German army weakened and a new Russian threat became apparent.

Explaining simply that "it would have been suicide to stay," he and his parents escaped by boat by way of the Baltic Sea to eastern Germany. An uncle of the youth, who helped the family flee the Baltic state, has never been heard from since.

Following months of aimless wandering throughout eastern Germany, the family joined thousands of other refugees seeking safety to the west. With their possessions limited to only what they could carry on their backs, the family lived chiefly on small pieces of earlier saved sugar and bread during this trek toward the Allied armies.

The war's end found them at an Allied displaced persons camp near Hamburg. Three years in such camps followed before Pettai was granted permission to study at the Cologne Conservatory of Music under the auspices of the International Refugee Organization.

It was the IRO and the American Methodist Church that later helped him and his parents to arrive ultimately in the U. S. in 1950.

After eight months' employment as an elevator operator in New York City, Pettai was awarded a scholarship at A & M, where he enrolled in January, 1951.

Now, having earned his degree, he has already accepted an engineering position with the Bell Telephone Laboratories in New Jersey.

Would he like to return to the old country some day?

"Some day, perhaps," he smiles, "but right now it would not be too healthy for me."—***End.***

Salary Survey Completed . . .

Final Results Show Chemical Engineering Highest Paid Branch, Contracting Highest Paid Field of Employment; N. E. Region Leads Nation

THE NSPE Salary and Income Survey, covering 1952 earnings, has been completed and the full report, now in final stages of production, may be ordered by members and others. The 1952-1953 Salary and Fee Schedule Committee which supervised the preparation and direction of the survey, under the chairmanship of Ole Singstad, P.E., of New York, states that the 28-page report contains a wealth of information which it is hoped will provide valuable data to members, state and local organizations, government agencies at all levels, educational institutions, engineering colleges, and others.

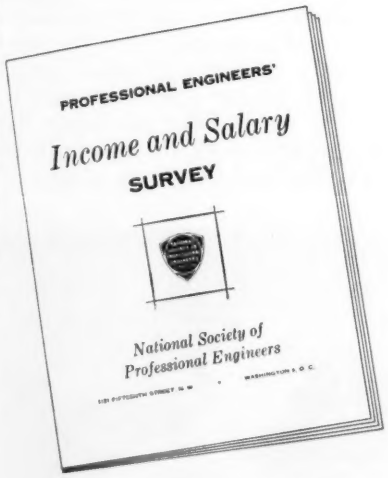
The survey, covering all NSPE members, was conducted in the Spring of 1953 by the use of a simple questionnaire and the results were tabulated by use of IBM equipment. A professional statistical analyst reviewed the resulting statistics, and the full report contains a number of graphic charts and tables to present the findings.

Among other major subjects, the report indicates that of the 12,443 professional engineers who responded to the questionnaire, the highest median income by regions was in the Northeastern section, showing a figure of $8,630. Of the eight listed fields of employment, contractors led with a median of $9,920; of the seven listed types of work, those in the executive-administrative field were high with $9,930; and of the five major branches of engineering, those engaged in chemical engineering were highest with $8,910.

Other findings in the report include geographic distribution of those responding, the year in which the respondents entered the profession, branches of engineering, kind of work performed, over-all earnings, earnings by years of experience, branches, fields of employment, type of work and grades.

The information on grades was based on the eight standard grades established in a previous study by the Salary and Fee Schedule Committee, ranging from Grade 1 (pre-professional), such as instrumentman, draftsman, detailer, junior engineer, to Grade 8 (professional), such as chief engineer, director of research, dean of school, etc. The information indicating salary and income for the eight grades is expected to be of particular value to state societies and chapters in connection with a review of their schedules of recommended minimum salaries.

Copies of the full report may be obtained by members and others by using the coupon printed at the bottom of this page.



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- Geographic Distribution
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- For Whom Did They Work
- In What Branch of Engineering Did They Work
- What Kind of Work Did They Do
- How Much Did They Earn
- Overall Earnings
- Earnings by Years of Experience
- Earnings by Branch of Engineering
- Earnings by Field of Employment
- Earnings According To Type of Work Performed
- Earnings According to Grades
- Regional Variations

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WHAT DO WE REALLY MEAN BY EDUCATION?

BY ROBERT H. NAU,
Professor of Electrical Engineering,
University of Santa Clara, Calif.

VOLTAIRE, (1694-1778) is credited with the poignant words, "If you wish to converse with me, you must define your terms." More than ever before, young people must be able to define and be willing to accept and use definitions upon entering industry or any of the professions in our technological age of H-bombs, guided missles, jet propulsion and computers. All professional people find an aptitude to read, to understand and to reason most helpful, if not necessary. The process of developing mentality is termed education.

This article, which is a discussion of education, re-emphasizes the importance of an education. It is then shown that a desirable way to get an education is through a diversified engineering curriculum. Consideration is also given to overemphasized engineering curricula which are offered by several colleges of engineering for the preparation of researchers and contractors.

Educators should have sound reasons in their minds why youth should take engineering. Opportunity in the engineering profession and the apparent shortage of engineers are not sufficient reasons for a youth to prepare himself for the engineering profession. Yet, the magazines have been flooded with tabloid-like feature articles and papers on "the engineering manpower shortage" and "opportunity in engineering." In a bibliography of 110 articles on opportunity, shortage and need for engineers—all published from January 1950 to June 1952—none of the articles presented a sound basis for the use in making a decision to obtain a college education.

IF a man is convinced at an early age of the importance of an education in gaining prestige in the business world, and also that it will provide a richer fuller life, he will without doubt strive with all his might to get such an education. The author has necessary and sufficient data to prove not only that the number who go to college is statistically small but also that the number who go to college is indeed a small percentage of the youth with college aptitude. Furthermore, of our youth who are among the highest 15 percent in mental aptitude, only one out of every four graduates from college.

The annals are replete with writings on the advantages of education. Plato (427-347 B.C.), in his *Republic*, indicated the importance of education by saying, "Youth is the time when the character is being molded and easily takes any impress one may wish to stamp on it. Shall we then simply allow our children to listen to any stories that anyone happens to make up and so receive into their minds ideas often the very opposite to those we shall think they ought to have when they are grown up?" Joseph Addison (1672-1719) stated succinctly, "Education is a companion which no misfortune can depress, no crime can destroy, no enemy can alienate, no despotism can enslave. At home a friend, abroad an introduction, in solitude a solace and in society an ornament. It chastens vice, it guides virtue, it gives at once grace and government to genius. Without it, what is man, a splendid slave, a reasoning savage."

The advantages of a college education are indicated by the kinds of jobs held and by the salaries obtained by college graduates. The recent book, *They Went to College*, which is a report of an extensive survey conducted by *Time* magazine, is most revealing. The *Time* survey disclosed what might have been expected: that the great majority of college graduates were in the highest income levels in the professions and occupied well-paying positions as entrepreneurs, managers, or semi-professional people. "The college graduate holds the key jobs in our society," says Mr. Havemann in the report. "The non-college man who rises to the top is a relative rarity. On the other hand it is unusual to find an Old Grad who is not at the top."

Social minded people know that education pays off for the young. Here is shown Student Margers Grins, a former displaced person, now studying engineering at Youngstown (O.) College. He has been awarded an annual grant of $100 from the Women's Auxiliary of the Mahoning Chapter, Ohio SPE. He is shown demonstrating a laboratory gas test to (l. to r.) Mrs. Richard Waugh, Mrs. R. E. Evans, Mrs. Robert Bryan, and Frank Ellis, Dean of the William Rayon School of Engineering. The women are officers of the organization.

In 1947, when the median income of American men was $2,200, the college men surveyed by *Time* had median earnings of $4,689. What is more, college graduates get wealthier as they grow older, and the graduates over fifty are three times better off in terms of earning power than the average man. In law, medicine and dentistry 62% of the graduates are earning $5,000 and over; in engineering there are 52%. All other fields of endeavor are lower, with sciences and mathematics ranking third at 44%, and business administration fourth with 41%.

PRESENT day technology practically requires a young man to have a college education for entry into most professions. Whereas in yesteryear a bachelor's degree from a college of liberal arts and sciences was felt to be about the best all-round education, today's youth find the best all-round education to be one achieved through a diversified engineering curriculum.

A diversified engineering curriculum is an engineering curriculum which contains 136 semester hours, leads to the bachelor's degree, and is fully accredited by the Engineer's Council for Professional Development. The semester hours of a representative diversified engineering curriculum are disposed with 62 in engineering, 7 in chemistry, 6 in drawing, 16 in mathematics, 12 in physics, 17 in required non-technical subjects (including rhetoric and hygiene), 9 in non-technical electives, and 7 in technical electives. Full provision is made for specialization by branch of engineering options within the particular branch e.g., electrical engineering with communication and power options.

Diversification is enhanced by two requisites. First, the 62 hours in engineering are divided about equally between the particular branch of engineering and "other engineering." Second, none of the 9 hours of non-technical electives can be chosen from physics, mathematics or engineering; whereas history, art, music, philosophy, business and psychology are recommended. The approximately 32 hours in "other engineering" should include, for electrical engineering, courses from theoretical and applied mechanics, mechanical engineering, and civil engineering. The courses in both "other engineering" departments and the non-technical departments should be given as much attention and held in as high esteem by the respective departments as are those courses in these respective departments for their own majors. Relaxation on this latter requirement causes decay in the benefits of a diversified engineering curriculum.

WITH properly administered diversified engineering curricula the courses in the "other engineering" departments become as cultural to the men in the respective branches of engineering as are non-technical courses in the liberal arts departments. "Culture," as defined by Professor A. N. Whitehead, "is activity of thought and receptiveness to beauty and humane feeling." Thus, training in engineering through a diversified program provides that which a man needs at the college level. Remember the definition written by Thomas Tredgold (1788-1829), "Engineering is the art of directing the great sources of power in nature for the *use* and *convenience* of man—art, not merely science; directing, not merely observing; convenience, as well as use; man imperfect and apparently not perfectible but very much alive." Engineers should study both human needs and natural forces. Their work is to control these forces for the benefit of man. As Hardy Cross has so aptly stated, "Engineering is, as it always has been, coexist with civilization. Engineers, perhaps more than other men, are interested in man, are interested in what men want and how men live and how men react to their environment."

In contrast to a diversified engineering curriculum is that which can best be called an overspecialized engineering curriculum. An overspecialized curriculum is obtained by allotting considerably more than half of the 62 hours in engineering of an E.C.P.D. accredited curriculum to a particular branch of engineering, with proneness to encroachment on the 9 hours of non-technical electives. As an example, one outstanding midwest university offers an illumination option in electrical engineering wherein 58 hours are required in the electrical engineering department, 8 hours in theoretical and applied mechanics, and zero hours in "other engineering." Furthermore, only 3 hours are allowed for non-technical electives.

THERE is only one justification for an overspecialized engineering curriculum at the four-year undergraduate level. Overspecialization may be justified when the sole aim is to produce researchers and contractors, and even then the justification is doubtful!

A word of warning has come to engineering colleges from Dr. Vannevar Bush. He warns against the relative trend from engineering to applied science. In order to prevent infiltration by applied scientists into engineering, the philosophy of engineering education must be revised. Engineering students who receive specialized training today are placed in a constricted niche, a niche which constricts them even further after graduation and placement in industry. Versatility, flexibility, and willingness to pioneer should be given more emphasis in engineering education. Dr. Bush explained the complication which results from lack of a definite line of demarcation between science and engineering: "An engineer is a man who applies science in an effective manner to supply human needs and desires. But . . . an applied scientist . . . apparently does almost the same thing. The difference lies in the definition of the word 'effective.' The applied scientist is ordinarily satisfied if he can develop a new device or a new process which will work, often for his own use or for the use of other scientists. To some extent, therefore, the engineer takes over where the applied scientist leave off."

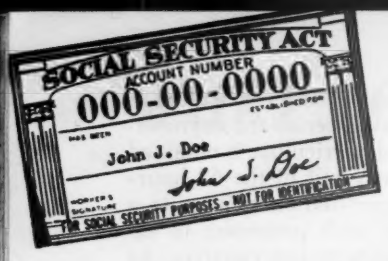
It is, therefore, proposed that everyone exert every effort to promulgate the advantages of an education and to sponsor diversified engineering curricula. Furthermore, it is proposed that educators take it upon themselves to educate engineers rather than scientists in our engineering colleges.—***End.***

The Author . . .

Prof. Nau

Robert H. Nau, the author of this article, is a professor of Electrical Engineering at the University of Santa Clara, Santa Clara, California. He graduated from Iowa State College in 1935, received his Master's degree in E.E. from Texas A & M in 1937, and has done further advanced work at the University of Illinois. During World War II, he saw service with the Signal Corps. He has worked with both Westinghouse and Allis-Chalmers but has devoted the major part of his professional career to teaching, his previous posts having been at Texas A & M and Illinois.

Professor Nau is the author of several books and more than thirty published technical papers and articles.



Attention: Self-employed P.E.'s!
Do You Want Social Security Coverage?

The Question: Self-employed persons were brought within the coverage of the social security law in 1950, with the exception of self-employed members of the learned professions (professional engineers, lawyers, doctors, architects, etc.). President Eisenhower has now proposed to Congress that the law be amended next year to add the self-employed professionals along with other presently non-covered groups. NSPE and other professional associations will be expected to testify on this recommendation very shortly. In order to make a proper recommendation the NSPE Board of Directors has decided to conduct this poll to determine the desires of the self-employed members who would be affected by the decision to be taken.

Who Should Vote? Only those members who are self-employed within the meaning of the social security law will be affected and should vote. You are self-employed if you engage in professional practice or are the owner or partner of a trade or business which is not incorporated. Those practicing in the corporate form are employees of the corporation within the meaning of the law and are *not* self-employed. If you are an employee and covered by social security, you should *not* vote. Or if you are an employee now covered by social security, earning at least $3,600 per year, and you also engage in some independent self-employment consulting or other work, you would not report the self-employment income as the tax is limited to the first $3,600 of covered income; hence such persons should *not* vote.

Benefits, Costs, and Limitations

In determining your vote on the question you should consider the benefits you would receive from being included in the social security system, the cost to you, as well as the limitations which exist regarding receipt of benefits. The social security law is complex and it is not possible in this space to provide all the details. The factors which are considered of major importance are set forth below but members eligible to vote may obtain additional detailed information by contacting their nearest field office of the Social Security Administration. A pamphlet available at these offices, "Your Social Security," will provide valuable additional information.

The Benefits: At the age of 65, the covered taxpayer under the present law would receive a maximum of $85 per month in retirement benefits to which would be added a maximum of $42.50 for a wife when she reaches the age of 65, and if the couple has a child under 18 years of age the maximum benefit would be $168.80. Survivors' benefits provide a maximum of $63.80 per month for a widow, widower, parent, or one surviving child, $127.60 maximum for a widow and one child and a total maximum family benefit of $168.75 per month. A lump-sum death benefit of three times the amount of the monthly benefit is also provided. These figures are all computed on a maximum basis and do not necessarily reflect the benefits the individual would receive, the actual benefits being computed on a somewhat complex formula involving age, years of coverage, and amount of covered earnings.

Cost: Self-employed persons would make their payments once each year (with their income tax report) on the first $3,600 of covered income according to the following schedule:

1954-1959—3%	**.....**	**(first**	**$3600**	**only)—$108**
1960-1964—3¾%	**.....**	**(“**	**“**	**“)—$135**
1965-1969—4½%	**.....**	**(“**	**“**	**“)—$162**
1970 & after—4⅞%	**....**	**(“**	**“**	**“)—$175**

Limitation on Benefits: Under the present law, monthly retirement benefits would not be payable between the ages of 65 and 75 if you continued practice and your net earnings averaged more than $75 per month during a taxable year. Self-employment earnings of $900 or less in a year would not affect the payments, but for each additional $75, or portion of $75, one month's benefit may not be payable. Benefits to other members of the family would not be payable for any month in which payment is not made to the covered taxpayer.

Proposed Changes In The Law: More than 200 separate bills have been introduced in the present Congress proposing changes in virtually every aspect of the law. Space does not permit a detailed analysis of these suggestions and it is not known which, if any, of them will be adopted. A large number of the bills call for removing the limitation described in the paragraph above or increasing the amount of allowable earnings without loss of benefits to $100 or more. A large number of the bills propose an increase in benefits and reduction of the retirement age to 60 instead of 65.

Pros and Cons: The NSPE Insurance Committee's report to the Board of Directors at the 1953 Annual Meeting listed some of the major arguments for and against coverage of self-employed professional engineers. The major points on both sides are extracted *on the opposite page* for your consideration in deciding how to vote.

IT IS IMPORTANT THAT ALL THOSE WHO WOULD BE AFFECTED BY THIS DECISION VOTE!

Ballot on Inclusion of Self-Employed Professional Engineers under Social Security

(Must be received not later than October 10, 1953.)

I am FOR ☐ including self-employed Professional Engineers in the Social Security program.

AGAINST ☐

I am a member of the ..... Chapter, ... Society of Professional Engineers.
(state)

.....
Name (optional)

Indicate your opinion by checking *one* of the boxes and mail the ballot form to: NSPE, 1121 15th Street, N. W., Washington 5, D. C. (If you want to add your reasons please do so on a separate sheet of paper.)

Oregon Supreme Court Holds Surveyor Need Not Be Registered

The Supreme Court of Oregon has reversed a lower court holding that an act of the legislature requiring county surveyors to be registered as professional engineers or land surveyors is valid (AMERICAN ENGINEER, April, 1953). The case arose out of the election in November, 1952, of Peter W. Welch as Multnomah County Surveyor. Welch was not registered as a P.E. or surveyor and his right to hold the office was successfully challenged before the Mulnomah County Circuit Court on the ground that an act of the legislature, supplementing the constitutional requirements for the office, required registration.

Welch appealed on the ground that the state constitution itself provides the qualifications for the office and therefore the legislature is powerless to prescribe additional requirements. The State Supreme Court agreed with this contention, holding the general rule of law well established that where a state constitution provides for certain officials and names the qualifications for such officers, the legislature is without authority to prescribe additional qualifications unless the constitution, either expressly or by implication, gives the legislature such power. The Court cited an array of cases in support of this principle, quoting Chief Justice Vanderbilt of New Jersey in a landmark case, "From the very nature of such a provision the affirmation of these qualifications would seem to imply a negative of all others. . . . A power to add new qualifications is certainly equivalent to the power to vary them."

The high court accordingly declared that Welch is entitled to the office of county surveyor to which he was elected.

Texas Judge Rules for Professionals

A petition for injunctive relief against local officials based on restricting bids on construction of a public building to the type of foundation piers specified by the architect has been denied by the Texas District Court of Dallas County. The architect retained to design a city-county hospital and related buildings specified that the foundation piers were to be constructed by the use of "piles" and a group engaged in the construction of drilled concrete pier foundations argued that this restriction was arbitrary, that the specification curtailed free competition and that the drilled concrete pier method would be just as satisfactory as the "pile" method. The county commissioners responded that the specification of the architect was supported by the county engineer and was based upon the recommendations of Southwestern Laboratories which had conducted a soil investigation at the site of the proposed building.

After hearing arguments from both sides, Judge W. L. Jack Thornton found that the petitioners were not entitled to the injunction and dissolved the temporary injunction which had been issued pending disposition of the controversy. Although the decision did not elaborate the point of reliance upon professional judgment, the case is quite analogous to a recent decision by the Ohio Supreme Court upholding the principle of the right of local officials to depend upon professional judgment in such matters (July, 1953, issue, AMERICAN ENGINEER).

Stevens Releases Student Handbook

An increasing interest in engineering, shown by high school students in recent months, has led to the preparation of a new booklet about the profession, released recently by Stevens Institute of Technology, Hoboken, N. J. Designed to answer questions about the work engineers do, the 16-page publication also discusses the scholastic attainments and special aptitudes which indicate whether a student should seek admission to an engineering college.

In explaining the purpose of the booklet, called *What's Engineering?*, Dr. Jess H. Davis, president of the Institute, revealed that Stevens and other engineering colleges have been getting more requests from high school students for information and for interviews relative to admission than they have received in several years. He said that high school counselors also were being called on to answer more queries about engineering careers. The new booklet was written with an eye to aiding both students and counselors.

The first part of the *What's Engineering?* booklet deals separately with engineering research, design, development and production. Later, in considering the engineer's future, it points out that today one engineer is needed for every fifty industrial workers, against one engineer for 300 workers in 1890.

Before Voting On Opposite Page Consider These Points:

Reasons FOR Coverage	*Reasons AGAINST Coverage*
Since a majority of young P.E.'s will be employed for a number of years before becoming self-employed, if ever, it appears logical to continue coverage to gain the additional benefits.	**Opposition to any and all forms of regimentation by the Federal Government. (Coverage would be mandatory under the President's proposal.)**
Those entering the self-employed field start with little capital and under present tax laws often find it difficult to accumulate savings for old age.	**A belief that the social security program will some day be abandoned by the Federal Government.**
Private insurance plans for retirement are expensive and on a dollar-for-dollar basis do not equal in value the social security benefits.	**A belief that mandatory participation is objectionable but that voluntary participation is desirable. (NSPE is already on record in favor of voluntary coverage)**
A young self-employed P.E. who dies, leaving a family, is in need of the insurance benefits.	**A preference for provisions in the income tax laws which would permit all self-employed practitioners annually to set aside a reserve for future retirement benefits.**
It is difficult for the self-employed P.E. to plan ahead for his own retirement program because his income varies considerably year by year.	**Most self-employed P.E.'s will not retire at 65 and will earn more than $75 per month from their practice; hence they will not receive the retirement benefits after paying into the fund.**

The Engineering Profession Needs Public Relations

By FLOYD A. LEWIS, P.E.

Member of the firm Dudley, Anderson and Yutzy, Public Relations Consultants

"THERE is really nothing wrong with the engineering profession today that a good dose of public relations can't cure."

Having made this bald statement to a fellow engineer with whom I was discussing such current problems as the shortage of engineers, low salaries, and the drafting of engineering manpower into nontechnical military work, I was immediately challenged to present proof. Because I had given the matter a great deal of thought since becoming engaged in public relations work several years ago, I was prepared to answer. The arguments advanced form the basis of this article.

Briefly, practically all of the major problems facing the engineering profession today have their basis in the profession's general lack of prestige. Although "prestige" is a commonly used term, its full meaning often is not thoroughly appreciated. Webster's Collegiate Dictionary defines it as: "1. Power to command admiration; hence, éclat; renown. 2. Ascendancy derived from general admiration or esteem; commanding position in men's minds." Because the public is not broadly aware of the engineer's essential role in modern life, the engineering profession does not hold a "commanding position in men's minds."

A survey recently conducted by the Engineering Manpower Commission shows that today there is an unfilled demand for more than 60,000 engineers. The shortage will increase in succeeding years because there are not enough engineers now in training in our colleges and universities. When it is considered that our very survival in today's global struggle depends squarely on the availability of adequate engineering manpower, this situation is seen as indeed appalling. Still in the face of this critical need, the government does not have the common sense or courage to exempt either engineering students or young practicing engineers from being drafted into nontechnical military work. Were the general public thoroughly informed about the matter, no public official would dare to cast his vote against exempting vitally needed engineers from military assignments not involving engineering duties. In other words, if the public were adequately informed as to the role of the engineering profession in society, this particular problem would not exist. Informing the public is a public relations function.

Careful analysis reveals that some of the reasons for the present shortage of engineers may be traced back to the dark days of the 30's. Engineers were blamed by many people for having brought about the great depression. Industrial efficiency had been raised to such a high level by the efforts of engineers, so the story went, that thousands of workers thereby were thrown out of jobs. The facts of the matter are, of course, that engineers have created many times more jobs and better paying jobs than they have eliminated. Nevertheless, engineers along with big business, became one of the scapegoats and we even heard pleas to declare a holiday on engineer training. Such statements deterred many promising young men with technical aptitude from selecting engineering as a career.

Thus, the resulting decrease in engineering enrollment during the depression, which was a direct contributing cause of the shortage of technical manpower during World War II, can be seen as stemming from public misunderstanding and becomes plainly a public relations problem.

After the shooting stopped, we again heard warnings that there would likely be too many engineers. As soon as we had passed the postwar peak in college and university enrollments, therefore, we again had a dropping off in engineering course enrollments, which is still continuing.

Current shortages of engineers of course are aggravated by the increasing demands for defense. Statistics show, however, that we would not have enough engineers even if we were not engaged in an accelerated defense program. The reason is that an increasing number of engineers are being required to maintain our present way of life. This is strikingly revealed in industrial statistics which show that today one engineer is required for every 52 workers in industry compared with almost twice as many workers 20 years ago. Since this trend is still increasing, the deficit in engineering manpower is bound to become even greater unless we can attract more young men into the profession.

OF necessity, measures are now being taken to spread our available engineering manpower over a broader base. Industry is making efforts to employ engineers only in work requiring engineering training. Promising young workers with technical aptitudes are being given training on the job to enable them to handle semi-engineering work. These measures are imperative today and they will undoubtedly result in a more efficient utilization of engineering manpower both now and in the future. But they do not meet the basic need of attracting more young men into the profession.

One reason why engineering is not drawing more candidates is that the profession does not enjoy a level of public esteem that its vital importance justifies. It has not developed the romantic or status appeal of medicine and law, yet inherent in the engineering profession are all of the elements for status and romance, as defined in the public mind. A program to interpret the profession to the public would raise it to the prestige due it and would inevitably make it more attractive as a career.

Perhaps one of the strongest reasons why engineering has not attracted more young men in recent years is that salaries have been too low. Some waiters in New York night clubs, for example, are able to support their families in higher style than the majority of engineers. Some salesmen in high-class department stores, working entirely on commission and without any responsibility beyond that of consummating sales, are today receiving more compensation than many chief engineers. Such conditions do not stimulate young men graduating from high school to embark on the four years of hard work required to earn an engineering degree. Today, the inexorable law of supply and demand is slowly raising the level of engineering salaries especially for men just out of college, but there are still widespread inadequacies.

Again, a program to acquaint the public with the true importance of engineering in modern life would help correct some salary inadequacies by raising the general prestige of the profession. If we depend entirely on the law of

supply and demand to solve the low-salary problem, correction is likely to be painfully slow.

The low salary scale has also worked in other ways to deplete our engineering manpower. Many practicing engineers are attracted to fields that are primarily non-engineering but where engineering training is advantageous. Some find that they are better adapted to work of this character; but in the vast majority of cases such shifts are made purely for the purpose of enhancing the economic status of the engineer and his family. In many instances engineers are attracted to fields where their training is not required at all, and a great deal of competent manpower is lost to the profession in this manner.

For some years, engineering leaders have recognized the need of greater prestige for the profession and have recommended various courses of action to bring this about. A suggestion commonly made is that engineers acquire greater social consciousness. Courses in the social sciences and the humanities have been added in many engineering schools. Such courses undoubtedly have had a broadening influence on those engineers who have taken them, but it is difficult to see how they have raised the prestige of the profession appreciably.

Engineers have been urged to take a greater part in civic and community activities, the argument being that they are better able to carry out such activities to the benefit of the community in this technological age than are non-engineers. Many engineering leaders have also urged that engineers become active in politics at least locally and more broadly if opportunities present themselves.

MANY engineers, particularly the younger ones, find it difficult to devote the necessary time required for participation in community activities. Because of the extremely rapid advancement of the profession, any engineer who attempts to keep up to date on even his own specialty must devote a considerable portion of his time to the study of current technical literature. In many instances, the low salaries paid to engineers have proved to be a deterrent because many community activities require the expenditure of money they cannot spare.

I agree that the more active engineers or any other groups are in a community, the better known they become locally; and if they are known for deeds of goodwill their local prestige will improve accordingly as individuals. But even widespread participation in community activities, can do little to enhance the over-all prestige of the engineering profession because most of these activities are non-engineering in character and professional prestige must be based on professional achievement.

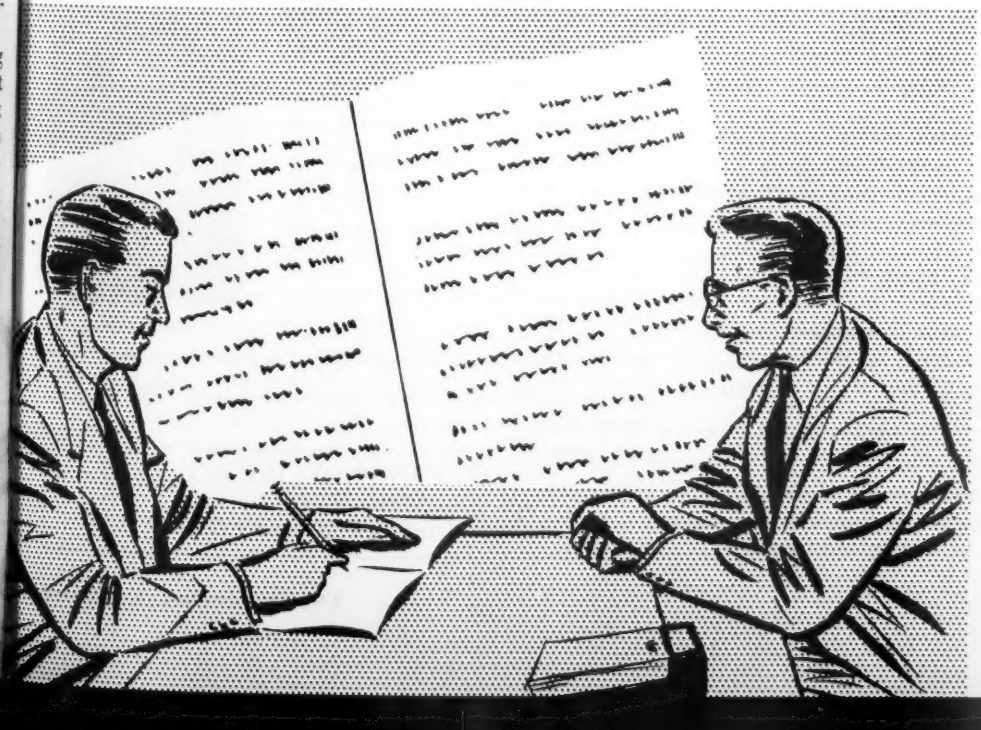
Unfortunately, achievement alone does not automatically gain recognition and prestige. If it did, the engineering profession certainly would rank among our most highly respected groups, for engineers are largely responsible for the development of our modern way of life with all its comforts and conveniences.

In order for the profession to achieve a "commanding position in men's minds," the good works of engineers must be brought forcefully to the attention of the public. This must be done in such a manner that the public will appreciate the true significance of engineering contributions to their everyday life. It must be done in such a manner that the public will also realize the essentiality of conserving and expanding our engineering forces if our way of life is to survive and continue to advance.

The problem of acquiring prestige thus boils down to one that is almost purely a public relations problem—one that can be solved by tried and tested procedures. Acquiring good public relations, which is what building prestige really means, involves primarily two things: performing acts of goodwill; and telling the public about them. To perform acts of goodwill, of course, implies that the performer has a feeling of goodwill to begin with. Engineers must already possess this to devote themselves so wholeheartedly to the betterment of mankind. That they have contributed so much toward the high standard of living we now enjoy is ample evidence that they have already carried out the first part of a good public relations program for their profession. They now need to carry out the second part—the telling; and if the telling were done as well as the doing, increased prestige for the profession would surely follow.

Various groups in the profession have attacked this problem in a limited manner. Most of the national engineering societies, for example, have publicity programs aimed at bringing the proceedings of the societies to public attention. All of these efforts contribute toward building up prestige for the profession because the most important engineering achievements are discussed in meetings of the societies. Since the primary aim, however, is to publicize the societies and their activities, such publicity is not broadly effective toward building prestige for the profession.

Celebration of the "Centennial of Engineering" in 1952, initiated by the 100-year-old American Society of Civil Engineers, brought the profession some public attention, especially during September when most of the country's



NSPE's Executive Research Survey public relations program is conducted through questionnaires sent to industry. Mutual problems of the profession and business leaders are discussed, and full reports issued for the benefit of all.

leading engineering societies held commemorative meetings. The meetings themselves were largely of a technical character and few attracted any appreciable attendance on the part of the general public. Unfortunately, some were not well attended by engineers either. However, the Centennial as a whole did provide a springboard for many newspaper and magazine articles calling public attention to engineering achievements during the past century.

THE American Chemical Society recently attacked the problem on a broader basis by initiating "a proposed educational program to acquaint the American public of the role of the scientist and engineer and the impact of science and technology on modern living." Such a program should help a great deal toward making the works of chemists and chemical engineers better known to the public. It will undoubtedly contribute toward building up the prestige of the engineering profession as a whole.

Perhaps the broadest-gauge engineering-society public-relations program now in operation is that of the National Society of Professional Engineers. During the past two years, the Society has spent more than $50,000 in preparation, publication, and distribution of its Executive Research Survey Reports. Objectives of the program are:

1. To inform employers and clients of engineers as to the value of the professional engineer and the meaning of professionalism.
2. To inform educators, who have direct influence on students and Engineers-in-Training, on the value of professionalism and the work of the Society.
3. To inform engineers and the general public on what the Society is doing to improve the standing of the profession.

The Surveys are conducted under the guidance of a 20-man committee of prominent Society members. Two reports have been issued covering: "How to Improve Engineering-Management Communications;" and "How to Improve the Utilization of Engineering Manpower." Two more have been scheduled dealing with: "How to Attract Qualified Engineers;" and "How to Train Engineers in Industry." This program should help materially to enhance the prestige of the profession, especially among those closest to the engineers—their employers and those utilizing engineering services.

How great an impact any of these programs will have on the general public depends on how effectively they interpret engineering contributions to society in simple language. How lasting their effect will depend on how long they are continued, for to have permanent value any public relations program must be a *continuing* one.

Building good public relations is an educational matter which takes time to produce lasting results. In addition, the public memory is unfortunately short, as witness public indifference to even vice and graft in public office after the excitement aroused by initial disclosures has subsided. A "commanding position in men's minds" can be maintained only by a continuing effort. Repetition (without being boring) is essential to making information "stick" in the public mind. To register an idea on public opinion it must be repeated over and over in many different ways in many different places.

The constant expansion of the public is another reason why a continuing program is necessary. The 1950 census, for example, shows the total population of the United States to be about 150,000,000—an increase of about 18,000,000 over the 1940 total. Every day brings new individuals to be informed.

The increase in population is not the only change the public audience is undergoing almost continuously. The mood of the times is constantly changing, too, with inevitable influence upon the climate of public opinion. The environment in which the public reacts and formulates its judgment of business or a profession is far different today than it was 50 years ago. Customs and practices change, and values are revised. What was acceptable 50 years ago may be frowned upon today, and the yardsticks which the public applied then have been replaced with new, different, and, in some cases, longer ones.

Such change requires revised interpretation of business and the professions. In many instances, the emphasis must be shifted from certain aspects of a profession to others in its relations to public opinion; in some instances entirely new elements must be brought forward into focus.

Public opinion is not like a commodity. You can't buy xx dollars worth of it, have it wrapped, and place it in cold storage. It won't keep.

Neither public opinion nor the environment of public opinion remains static, no more than the numerical count. Only through continuing effort can a business or profession keep pace with the continuous change in, around, and upon the public.

Continuity is necessary also to the long-range planning that is so important to effective public relations work. One shot of publicity, or even a few shots, no matter how spectacular, will never do the job. Publicity is so evanescent that it must be regarded as only one of public relations' tools and will gain results only when used along with other tools, all being applied to the same ends. Without continuity, publicity tends to be diffused and to fade quickly. Continuity permits coordination of all publicity and other activities to the same, selected objectives with resulting concentrated impact. It is the difference between using a shotgun or a rifle. In public relations, the shotgun has its place, but it is both less effective and more expensive than the rifle trained on specific targets.

FINALLY, only a continuing program can keep pace with the present meteoric progress of the engineering profession. Such a program, carried out in a manner that has been found effective for other groups, would lead to a fuller public appreciation of engineering achievements and thus to greater prestige for the profession. It would help engineers to enjoy the level of prestige they have well earned and would thus ameliorate many future problems of the type facing the profession today.

The Author . . .

Floyd A. Lewis, P.E., is one of the few registered engineers engaged in public relations work. Following graduation *magna cum laude* from Syracuse University in 1926 (E.E. degree), he began his career in the test department of the New York Edison Company (now Consolidated Edison Company of New York), later transferring to the distribution department. In 1930 he became engaged in magnetic research at Bell Telephone Laboratories, but resigned the following year to join the editorial staff of *Electrical Engineering*, official monthly publication of the American Institute of Electrical Engineers. Beginning as assistant editor, he was named associate editor in 1936 and acting editor in 1942 while the editor was on wartime leave. He re-entered industry in 1945, becoming associated with Hooton Chocolate Company, Newark, New Jersey, later being named vice-President and factory manager of that company. In 1947 he became associated with Dudley, Anderson and Yutzy, public relations counselors, New York, where he has since been serving a variety of industrial clients.

Mr. Lewis

SELF-EMPLOYED P.E.'s
Do You Want Social Security?
Refer to Page 22 and VOTE!

By
Milton F. Lunch,
N.S.P.E.'s Legislative Analyst

Few subjects are of more importance to engineers than that of the development and preservation of the Nation's natural resources. Thousands upon thousands of professional engineers earn their livelihood, to one degree or another, out of the utilization and protection of the natural resources of the country, and engineering talent has always been looked to for guidance when the problems involved in natural resource development and protection are raised.

That this all-important subject is to receive major attention in the near future is pointed up by a message from President Eisenhower to the Congress just before adjournment. Sounding, as it were, a "call to arms" in the interest of a long-range aggressive federal-state-local program to stop the accelerating drain and waste of natural resources, the President said that the nation needs "to give increased attention to the improvement and reclamation of land in its broadest aspects, including soil productivity, irrigation, drainage, and the replenishing of ground water reserves, if we are adequately to feed and clothe our people, to provide gainful employment, and to continue to improve our standard of living."

Among the specific items requiring study and action, the President mentioned multiple-purpose land and water resource developments, river basin planning, basic power policies, flood protection works, conservation measures, water erosion, and a number of other typical problems. The Chief Executive told Congress that he would send them "suitable" recommendations for achieving the objectives of his message during the next session, starting in January.

Some of the subjects indicated in the President's message are literally political dynamite, but there is no indication as to what his recommendations will be on these "hot potatoes." For instance, the President mentioned "the complicated problems of overlapping and duplicative authority among the several resource development agencies." This language immediately brings to mind the long-standing argument over the proposal to transfer the civil functions of the Army's Corps of Engineers to the Interior Department's Bureau of Reclamation. The original Hoover Commission recommended such a move and the suggestion brought about immediate and vigorous denunciation by important members of Congress, state and local officials who feel that the Corps of Engineers has done an outstanding job in the civil works field, and those who felt that such a change would seriously impair the Corps wartime capabilities which, it is alleged, come about in large part due to the peacetime training the officers receive in the civil works assignments. It has been rumored on several occasions that President Eisenhower leaned in favor of the Hoover Commission policy but there has been no official indication to this effect. With the Hoover Commission now re-activated and with the same Chairman (ex-president Hoover) as before, it is not unlikely that the recommendation may be reaffirmed.

Another explosive issue could arise out of a Presidential recommendation on the question mentioned by him of "comprehensive river basin planning." Although the message added that this should be done "with the cooperation of State and local interests," it may bring to the fore the matter of "valley authorities," which have been proposed for almost every valley in the nation, modeled along the lines of the Tennessee Valley Authority.

The President has made it quite clear that he will not favor any more TVA's, as witnessed by his remark during a recent press conference that TVA was an example of "socialistic" planning. This reference touched off an immediate reaction by the defenders of TVA. Governor Frank G. Clement of Tennessee, for instance, denounced the statement at the Governors' Conference in Seattle, Washington as "uninformed" and based on erroneous facts supplied to the President by private power sources. In his message, the President made several references to state and local cooperation in resource development, mentioning "a cooperative partnership of the States and local communities, private citizens, and the Federal Government in carrying out a sound natural resources program." This is the theme

(Please turn the page)

mentioned by the President on a number of occasions, seconded by Secretary of Interior McKay, who developed the point at some length in his article, "Public Power—A Policy for the United States," which appeared in the August, 1953, issue of the American Engineer. With this basic philosophy in mind, it will be most unlikely that the President's recommendations will foster any more federal valley authorities. But a strong group of legislators who favor a Missouri Valley Authority, and similar agencies for other parts of the country, may be expected to attempt to amend the legislative actions of the President's suggestion to meet their own thoughts on the subject.

A final example of the type of controversy which may be generated when specific actions are suggested concerns the President's reference in his message to the management and utilization of public lands. During the recent session of Congress a rather vigorous effort was made to pass legislation which would have vested greater rights for private individuals in the public lands. This attempt failed in the face of strong opposition, principally from Western groups, but the sponsors of such legislation will probably revive it when the administration proposal is sent to the Hill.

Tying in with the President's "keynote" on natural resources, is the forthcoming Mid-Century Conference on Resources for the Future, which is scheduled to be held in Washington, D. C., the latter part of this year and in which a large number of experts in various facets of natural resource problems will participate. A considerable number of nationally-known professional engineers are active in planning the meeting. The conference was organized at the invitation of the Ford Foundation and is intended to establish "long-range programs of research and education to assure the resources essential to the progress, vigor, and security of the nation." President Eisenhower has endorsed the conference and is expected to open it in person. In view of the distinguished reputations and specialized knowledge of those to participate, embracing almost every expert in the natural resources field, it would not be surprising if the conference's discussions and recommendations were very influential in the formulation of the President's recommendations to the next Congress.

* * * *

The May, 1953, "From Washington" report discussed the rather drab, but very important, question of government policy on a "broad" mobilization base or a "narrow" base, and pointed out that Defense Secretary Wilson had indicated his preference for the more restrictive policy in order to reduce federal defense expenditures.

The "broad base" proponents have now evidently won the argument based on the action of Congress in appropriating the $500 million requested by the previous administration to start a program of stockpiling industrial plants and tools. In addition, Arthur S. Flemming, Director of the Office of Defense Mobilization, has issued a policy statement, with the concurrence of the President and the Cabinet, which reaffirms the previous policy.

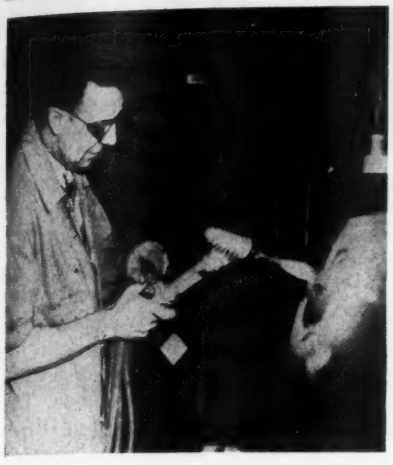
The Flemming statement calls for a broad survey of American industry's capabilities for war production, assuming "rock-bottom" civilian requirements. "Thus the ground will be laid for decisions as to whether to fill in gaps in the national plant, or modify the military plan, or both. In either event, some of the costly diversions of resources from weapons production to plant expansion, and most of the two years' loss of time before a high level of weapons production was attained in World War II, can be telescoped or avoided," the administration policy stated.

Of particular interest to the engineering profession is the recognition in the statement of the need for technically trained personnel. Flemming said that when the studies are completed and consideration is given to decisions on expanding mobilization base capacity, "that expansion will presumably be concentrated on providing long lead-time, difficult-to-produce, and critical types of tools, equipment, instruments, materials, energy, and technically trained personnel."

The difference in approach between Secretary Wilson's views and the "broad base" theory was illustrated to some extent recently in the Defense Department decision to close down heavy aircraft press and C-123 airplane production at the Willow Run plant of the Kaiser Company. The ODM denied that this action was contrary to the basic policy as announced, and that the Kaiser decision involved only "management problems" and "re-evaluation of the program." But others are interpreting the action as following Wilson's policy of closing down "uneconomical" production units and concentrating production with an eye on the dollars rather than the maintenance of industrial sources which may be needed when and if all-out war production becomes necessary.

"It has never been a part of the mobilization policy that there be continuous production in high-cost secondary sources," Flemming said. "It may be necessary in the future to end production in some plants because of poor efficiency, high costs, or the fact that mobilization reserves are full. A number of alternative ways of maintaining the mobilization base are planned, including stand-by plants, storage of tools, and adjacent and centralized storage."

- - NEW PROCESSES - -



Portable "flame-spray hand-gun" shoots molten porcelain material through high temperature acetylene flame and fuses it to steel.

Portable Gun Combats Steel Corrosion

A new technique in the war against steel corrosion, which annually causes billions of dollars worth of property and materiel damage, is announced by M. J. Salton, president, Seaporcel Metals, Inc., manufacturer of architectural, marine and industrial porcelain products.

The process, utilizing a novel device called the "flame-spray hand-gun," which shoots porcelain material through an acetylene torch and fuses it to steel, has been under experimentation for 18 months and is the result of years of porcelain study by Paul Cecil, the company's chief of research. The gun is still undergoing tests and development in the Seaporcel laboratory at 28-20 Borden Avenue, Long Island City 1, N. Y.

By virtue of its portability, the equipment will open the way for the applying of porcelain in the field for the first time to bridges, maritime vessels, buildings and other steel structures too large physically for factory treatment.

Basically duplicating the factory process in which glass is fused permanently to steel in a high temperature furnace, the new device simultaneously melts and fuses the ceramic ingredients on to the metal through the flame. In the first stage of application, the flame, from the gun's one-inch nozzle. preheats the steel surface. When the desired temperature is reached, the porcelain mixture is blown through tiny holes circling the nozzle. As this material passes through the flame, it melts at approximately 1,600 degrees F. and is fused to the metal plate. The result, in a matter of minutes, is a glass-like, color-fast, stable finish.

Cold Reducing of 18-Inch Tubes

A giant compression method tube reducing machine now under construction for Tube Reducing Corporation of Wallington, N. J. will increase by several fold the size of tubes that may be cold sized by this unique process. The new machine will process ingoing tubes up to 18 inches O.D. Largest compression reducer now being used takes an ingoing tube of 6½ O.D.

The new machine will be over 100 feet long. It will use dies weighing over 7500 lb. each. When completed, it will produce precision seamless tubing ranging in size up to 17-inches in diameter, with walls as light or lighter than 0.125-inch in 10-inch tubing, 0.175 in 14-inch tubing, and 0.200 in 16-inch tubing.

The new larger tubing will be used for making large sized ring-shaped parts, cylinders, accumulators, casings, large volume pressure conductors and products for thin-walled, high-strength applications. Tubing metal processed can be carbon and alloy steels, aluminum, copper and brasses, stainless steel, titanium, and any other less common metals coming in rise today. Also, the development of larger aircraft, rockets, jet engines and other military items has increased the demand for larger-diameter light-wall precision seamless tubing.

"Testing Topics" . . .

An external house organ of Baldwin-Lima-Hamilton Corporation, in a recent issue, treats several new processes of particular interest to engineers.

The first article covers the development of an instrument to test the creep characteristics of steel wire under tension; as it is in prestressed concrete construction.

Second article is a picture-caption story telling HOW TO DESIGN a casting to be competitive with a forging by use of simple stress analyzing methods.

Third is a well-illustrated article on HOW TO MAKE a bonded electric resistance strain gage with mercury (instead of 1-mill wire) for use on materials of high stretch such as rubber.

Fourth is an article telling how to eliminate a bottle-neck resulting from the speed of accumulating test data with modern testing equipment, and the time required for reduction of data from analogs to figures.

Several other items add to the value of this issue of "TESTING TOPICS." Available from Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pa. Request Vol. 8, No. 2.

Industrial Cleaning With Ultrasonic Waves

The Detrex Corporation of Detroit, Mich., manufacturer of industrial cleaning equipment and chemicals, has announced the development of an advanced, practical method of metal cleaning through the use of ultrasonic waves.

The new method, known as the Detrex Soniclean Process, features a man-made element for directing sound energy—a development which Detrex technicians say opens the door to far-reaching advances in a wide variety of industrial fields.

"Use of the new transducer element unquestionably takes ultrasonic cleaning out of the laboratory 'dream' stage and makes it a production reality," W. F. Newbery, director of sales for Detrex, said in announcing the new process. "By employing this new element in place of the quartz crystals previously used in ultrasonic experiments, we have overcome the limitations caused by the size and properties of quartz."

The element, jointly engineered by Detrex and the Brush Electronic Company, is a curved piece of ceramic resembling a six-inch-long pipe, cut in half along the longitudinal axis. The ceramic pieces, which can be connected in series and arranged as desired, are designed to offer exceptional focusing and flexibility properties.

In the Detrex Soniclean Process, electrical energy is transmitted to the ceramic transducer, converted into sound energy, and projected through a solvent at a frequency of 430,000 cycles per second. The solvent currently being used is trichlorethylene; however, the process is not limited entirely to this material. Because a potential of only 40 volts is required to operate the ceramic transducers, they can be safely immersed directly in the solvent.

Material to be cleaned is placed in the solvent, either manually or by conveyor, directly in the path of greatest focal intensity of the ultrasonic waves. In this area an extreme turbulence is created, resulting in a deep and penetrating cleaning action that removes all dirt, grease, chips and microscopic particles of soil from even intricately designed and close-fitting parts. In regular degreasing equipment, the Soniclean Process will be added to the cycle for "the maximum refinement" in cleaning a part to meet the most rigid standards.

N.S.P.E. Believes

The Function of the Board

BY PAUL H. ROBBINS, P.E.

Executive Director

N.S.P.E.

THIS issue of the AMERICAN ENGINEER carries a presentation of the background of the individuals who govern the National Society of Professional Engineers.

Most members of the Society are familiar with their chapter officers and the procedures at the local level for determining policy and implementing programs. A number of members have the opportunity at one time or another either to participate in or to observe similar policy discussions at the state level. But, because of the widespread geographic nature of our National Society, a lesser number of our members have an opportunity to participate in and observe the activities of the NSPE Board of Directors.

The Board of Directors of the National Society is its principal governing body. Its meetings are always open meetings and, within the limits of time available, any member is permitted the privilege of the floor. The occasion of a meeting of the National Board of Directors is an opportunity for all members in that region to observe and participate in these national discussions. Members are always welcome.

Composed as it is of representatives of the various affiliated state societies and the national officers, it brings to the conference tables a cross-section of the engineering thinking of the nation. Not only is there thus presented the points of view from various sections of the country, but a review of the Board will show representation of the major fields of employment. This year's Board indicates the following statistics:

33%—Employed in Industry
24%—Engaged in Private Practice
19%—Employed in Government
13%—Employed in Public Utilities
11%—Employed in the Education Field

Each Director has a vote for each 500 members, or fraction thereof, of his state society. A number of our states send a National Director for each vote they have, and in the larger state societies where such representation would present a considerable expense the pattern has developed to send two Directors, with overlapping terms of office.

The responsibility of each Board member is two-fold. He comes to the meetings concerned with national problems armed with the representative thinking of his state and uses his judgment on national policies in accordance with the discussions presented at the meetings and his observations of the thinking of the members he represents. Once the national policy has been determined, he has the responsibility of reporting back to his state society the discussions he has heard and the decisions reached. The responsibilities of the Board of Directors far exceed the mere attendance at national meetings. Many of our Directors prepare a rather extensive review of such meetings for the benefit of the state officers, usually report orally at the next meeting of the State Board of Directors, and many times prepare a review for the state publication or for distribution to the chapter officers.

Most of the National Directors do a considerable amount of speaking before chapter meetings, and it is through this medium, as well as discussion with members throughout the state, that they are able to sense the feeling of the state membership on national programs. Furthermore, many of the National Directors serve on national committees, which is an additional responsibility.

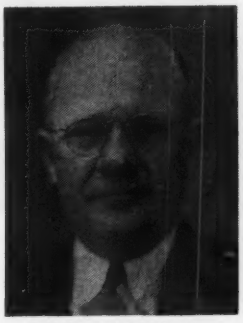
Following any NSPE Board Meeting, observations of those who have attended for the first time will generally be along these lines: "This is the hardest-working governing body of any Society I have ever seen." "It has certainly been a stimulating and inspiring experience to see the caliber of men on this Board giving such serious consideration to the welfare of the engineering profession." "I am impressed with the sincerity and effort being put forth by these men on behalf of all of us." It is unfortunate all of the members cannot hear these remarks.

When it is realized that these Directors must take time from their busy lives to serve in such a capacity and that their only reward is the sense of contribution to the welfare of the engineering profession, each of us as a member of the Society owes them a debt of gratitude which is difficult to express.—***End.***

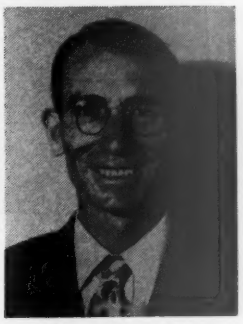
NATIONAL BOARD OF DIRECTORS–1953-54

L. W. Peterson
Alabama

W. A. Burg
Arizona



R. J. Rhinehart
Arkansas



Oliver Deatsch
California

S. H. Hawkins
Colorado

H. A. Pfisterer
Connecticut

W. A. McWilliams
Delaware

J. H. Powers
District of Columbia

E. A. Anderson
Florida

Orbie Bostick
Georgia

Alabama. L. W. Peterson, P.E., was born June 18, 1916, in Munising, Michigan. Mr. Peterson was formerly the President of the Alabama Society of Professional Engineers. He is the District Manager of the Goodman Manufacturing Company in Birmingham and holds memberships in the Birmingham Engineers Club, American Society of Mechanical Engineers, American Society of Military Engineers, and the American Society of Mining and Metallurgical Engineers.

Arizona. W. A. Burg, P.E., a graduate of Missouri School of Mines and Metallurgy, received his B.S. in C.E. from that institute. Mr. Burg was born December 4, 1901, in East St. Louis, Illinois. He is presently affiliated with the Arizona Highway Department in Phoenix.

Arkansas. R. J. Rhinehart, P.E., was born August 20, 1900, in Plymouth, Indiana. A B.S. in E.E. in 1922 and an E.E. in 1926 were received from Purdue University. Mr. Rhinehart is Superintendent of the Arkansas Power and Light Company in Pine Bluff. From 1949-50, he served as President of the Arkansas Registration Board for Professional Engineers. In 1939 he was elected by the people of Pine Bluff as "Our Leading Citizen."

California. Oliver Deatsch, P.E., was born August 19, 1909, in Modesto, California. He graduated from Modesto Junior College in 1930. In addition to duties as Deputy County Surveyor and Building Inspector, he is Assistant County Engineer and Road Commissioner. In 1948 Mr. Deatsch attended the formation meeting of the California Society of Professional Engineers, and has held several offices since then.

Colorado. S. H. Hawkins, P.E., a native of Colorado, received his B.S.M.E. from the University of Colorado in 1935. He has done extensive graduate work there as well as at the University of Denver and Colorado State College. A resident of Denver, since 1948 he has been Administrative Assistant in charge of engineering and new construction for School District No. 1 of that city. He is a charter member of the Professional Engineers of Colorado, and has served the Society in numerous official capacities, including a 1951 term as President.

Connecticut. H. A. Pfisterer, P.E., was born in Hyde Park, N. Y., in 1908. He received a C.E. degree from Cornell University in 1929. Since 1941 he has headed his own consulting firm in New Haven, and at present he is also serving as an associate professor of architecture at Yale. He has previously taught at Cornell and New York University and also done structural design and other engineering work. He is a member of the Connecticut Society of Civil Engineers, the A.S.C.E., and the American Concrete Institute.

Delaware. W. A. McWilliams, P.E., was born in Dillsburg, Pennsylvania on October 1, 1899. From 1947 to 1950 he was Chief Engineer of the Delaware State Highway Department and is presently Director of Construction, Delaware Memorial Bridge for the Crossing Division, Delaware State Highway Department. Mr. McWilliams is a member of the American Society of Civil Engineers and a Colonel, U. S. Army Reserve.

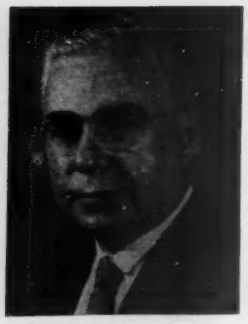
District of Columbia. J. H. Powers, P.E., born April 15, 1902, in Rome, New York, graduated from the Clarkson College of Technology with the degree of B.S. in C.E. in 1926. He was first Vice President of the D.C. SPE from 1950-51 and President from 1951-52. Mr. Powers is employed by the U. S. Bureau of Public Roads as Bridge Engineer.

Florida. E. A. Anderson, P.E., was born in Batavia, Illinois, November 23, 1902. He was educated at Lake Forest University and the University of Illinois, and his early engineering experience was obtained with various south Florida firms during the State's "boom years." After several years with the Florida State Road Department, he joined the engineering staff of Dade County and for the past six years has been head of that Dade County department. He is also a past president of the Florida SPE.

Georgia. Orbie Bostick, P.E., born October 11, 1909, in Alabama, received his B.S. in C.E. in 1932 from Auburn. In 1937 he received his M.S. in C.E. Mr. Bostick was employed as a junior engineer by the Atlanta Gas Light Company in July, 1937, and has remained with this company except for the four-year period with the army. He is now Chief Industrial Engineer.

R. J. Boston, P.E., received his B.S. in C.E. from Georgia Institute of Technology. He received his M.S. in Sanitary Engineering from Harvard University and studied law at the Emory University Lamar School of Law. In 1933 he gained employment with the Georgia Department of Public Health and now holds the position of Chief Sanitary Engineer and Director of Environmental Health Services. Mr. Boston was the first President of the Atlanta Chapter. He is a special consultant to the U. S. Public Health Service and is a Senior Sanitary Engineer in the Inactive Reserve of USPHS.

Idaho. L. M. Huggins, P.E., was born November 10, 1889, in Conde, South Dakota. He graduated from the University of Oregon in 1912 with a B.S. in C.E. He has worked with Waddell & Harrington, consulting bridge engineers, the Union Bridge and Construction Co., the City Engineer's office in Portland, Oregon, and the Oregon Highway Department. With the U. S. Bureau of Public Roads from 1918 to 1951, he was assistant in general charge of engineering and construction for the Alaska



R. J. Boston
Georgia

L. M. Huggins
Idaho

George DeMent
Illinois

L. I. Osborn
Illinois

L. E. Easley
Indiana

W. G. Johnson
Kansas

O. W. Turpin
Maryland

E. L. Blair
Massachusetts

E. R. Gardner
Massachusetts

P. S. Calkins
Michigan

Highway, 1942-44, and District Engineer, 1944-51. He retired in 1951 and in February, 1953, set up his own consulting practice in Boise in which he is now engaged.

Illinois. George DeMent, P.E., was born in Chicago, Illinois, in 1904. He was educated at the University of Illinois. From 1927 to 1939 he worked on the construction of an Intercepting Sewer System and Sewage Treatment Works of the Sanitary District of Chicago. Since 1939 he has been associated with the City of Chicago building subways and superhighways. He is now Assistant Chief Engineer of the Department of Subways and Superhighways for the City of Chicago.

L. I. Osborn, P.E., was born in Cable, Ill., June 18, 1905. He was educated at Augustana College, Rockford, Ill., and the University of Michigan at Ann Arbor. After working with various engineering firms, as well as briefly with the TVA, in 1937 he organized the consulting firm of Osborn and Roys, Inc. From 1940 to 1943 he was engaged in special assignments with the Army Engineers, and in 1944 he established his present firm—Lee I. Osborn, consultant in engineering and heavy construction. His home is in Sherrard, Ill.

Indiana. L. E. Easley, P.E., was born October 8, 1908, at Jerseyville, Illinois. He was State Director from 1947-48, Vice President in 1949 and 1950 and President, in 1951. Mr. Easley is Supervisor of Structural and Mechanical Engineering, Plant Engineers Office, Allison Division of General Motors Corporation, Indianapolis, Indiana. Mr. Easley is in *Who's Who in the Midwest,* is a member of the Building Congress of Indiana, the Indiana Engineering Council and is a Mason.

Kansas. W. G. Johnson, P.E., born July 14, 1899, in Salem, Nebraska, gained his education at Nebraska State Teachers College in Peru, Nebraska, and Colorado School of Mines, Golden, Colorado. From 1928 to the present, Mr. Johnson has been employed by the State Highway Commission of Kansas. Since 1945, he has been Engineer of Secondary Roads. He has held several offices on the State and National levels.

Maryland. O. W. Turpin, P.E., was born November 15, 1900, in Washington, D. C. He is a graduate of Baltimore Polytechnic Institute and received his engineering education from Johns Hopkins University in Baltimore. Mr. Turpin is a past president of the MSPE. He is a member of the A.S.C.E., A.W.W.A., and several other organizations. He is a partner in the firm of Turpin, Wachter & Associates in Baltimore.

Massachusetts. E. L. Blair, P.E., born February 9, 1896, in Waukegan, Illinois, is a graduate of Lowell Institute. He is a member of the A.S.M.E., A.S.H.V.E., N.F.P.A. and is listed in *Who's Who in Engineering.* Mr. Blair was Treasurer of the MSPE from 1947-51. At present he is Chief Building Service Engineer for Stone & Webster Engineering Corporation, Boston.

E. R. Gardner, P.E., was born in Winthrop, Massachusetts, February 21, 1908. He graduated from M.I.T. in 1930 with B.S. and M.S. degrees in Electrical Engineering. Mr. Gardner is employed by General Electric Company and for the past six years, has been carrying out new product development for the Aircraft Instrument Division. He is former Past President and Secretary of the North Shore Chapter, MSPE.

Michigan. P. S. Calkins, P.E., was born October 24, 1902, at Ann Arbor. He received his B.S. in engineering from the University of Michigan in 1924. After employment with various firms, in 1944 he set up his own practice as a consultant in structures and foundations in Detroit. In 1948 he moved his office to Bloomfield Hills, Mich. He was a charter member of the Detroit Chapter, MSPE, and served in various official capacities, including a term as president. He was also President of the Michigan SPE for the 1952-53 term. He is a member of the American Concrete Institute, the A.S.C.E., and the Engineering Society of Detroit.

A. F. Plant, P.E., was born in Buffalo, New York. He graduated from Ohio Northern University with the degree of B.S. in C.E. and did graduate work at Columbia. Mr. Plant joined The Austin Company in 1920 and is now Vice President and a member of the Board. In 1935, upon its organization, he was made President of Austin Engineers, Inc. He was President of the Detroit Chapter in 1947 and has held several offices since then. Mr. Plant has also had an honorary degree of Doctor of Engineering conferred upon him by Ohio Northern University.

Minnesota. Hibbert Hill, P.E., born in Boston, Mass., October 11, 1900, is Chief Engineer with the Northern States Power Company of Minneapolis, with which he has been associated since 1936. In 1923 he received his B.S. in C.E. from the University of Minnesota, where he later served as an instructor in 1924-28. He has done engineering work with several Government agencies and in 1942-45 was a Lt. Col., U. S. Army Corps of Engineers. He is the author of various technical articles and a member of Tau Beta Pi, A.S.C.E., the American Society of Military Engineers, and other groups.

M. C. Peterson, P.E., was born December 29, 1901, in Escanaba, Michigan. He received his B.S. in C.E. from Michigan State College in 1928 and his M.S. in 1930. Mr. Peterson was President of the Northwest Chapter from 1945-47 and has held several offices since then. At present, he is Director, Division of General Sanitation, Minnesota Department of Health, University Campus, Minneapolis, Minn. He is first Vice President and Director of the Minn. Federation of Engineering Societies and a Fellow, American Public Health Association.

Missouri. H. J. Bruegging, P.E., was born April 8, 1911, in Jefferson City and is a graduate of the Missouri School of Mines with a B.S. degree in C.E. He is Second Vice-President of the Missouri SPE and a past president of the Engineers Club

A. F. Plant
Michigan

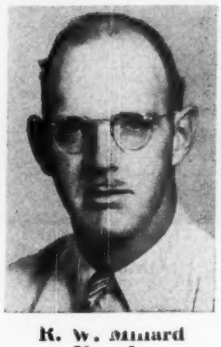
Hibbert Hill
Minnesota

M. C. Peterson
Minnesota

H. J. Bruegging
Missouri

J. B. Butler
Missouri

B. H. Backlund
Nebraska



R. W. Millard
Nevada

E. R. Boaté
New Jersey

W. E. Christian
New Jersey

L. F. Frazza
New Jersey

of Jefferson City. He is Gas Engineer for the properties of the Missouri Power & Light Company.

J. B. Butler, P.E., is a Professor and Chairman of the Department of Civil Engineering, Missouri School of Mines. He was born May 11, 1895, in Omega, Oklahoma. Professor Butler received his B.S. in C.E. from Oklahoma A. & M. College in 1915; B.S. in Education in 1924 from the Missouri School of Mines; C.E. in 1922 and his M.S. in C.E. in 1924. He is a member of Chi Epsilon Honor Soc., Phi Kappa Phi Honor Society, A.S.C.E., Engineers Club of St. Louis and several other organizations. He has been in *Who's Who in Engineering* since 1925 and in *Who's Who in America* since 1941.

Nebraska. B. H. Backlund, P.E., is a resident of Omaha, Neb., and head of a consulting firm bearing his name that specializes in design, field survey, and construction supervision of both public and private works. Mr. Backlund received his B.S. in C.E. from Iowa State College in 1941. During the war he served with the U. S. Army Corps of Engineers in the United States and in the South Pacific and European theaters. He established his own business in 1951.

Nevada. R. W. Millard, P.E., born December 12, 1911, in Ely, Nevada, is a graduate of the University of Nevada. His B.S. in C.E. was received in 1933. Since 1946, Mr. Millard has been associated with F. W. Millard & Son, Consultant Engineers in Ely.

New Jersey. E. R. Boaté, P.E., was born in Brooklyn, N. Y., and achieved his engineering education at Columbia University and through Cooper Union Institute and Rutgers University extension courses. He was Chief Engineer of the North Jersey Quarry Co. for 18 years; then was Vice-President and Treasurer of Bacon-Pietsch Co., New York City; and now is President and consulting engineer with his own firm, E. R. Boaté Co., Inc. He is also serving as City Engineer of Rahway, N. J., and is a past president of the Professional Engineers Society of Union County.

W. E. Christian, P.E., was born in Trenton, New Jersey, January 27, 1898. He studied in the College of Engineering, University of Illinois from 1916-18. He supervised the paving of fourteen miles of the New Jersey Turnpike in 1951. Mr. Christian is presently associated with Hefler-Snyder Company of Plainfield, N. J. He is a member of the Lions, A.S.C.E., and is a former President of the Raritan Valley Society of Professional Engineers.

L. F. Frazza, P.E., immediate Past President of the NJSPE, was born in Bergen County, N. J. He is Assistant Manager in the Transite Pipe Department, New York district, of the Johns-Manville Sales Corporation with which he has been associated since 1937. Mr. Frazza received his technical education through an I.C.S. course and extension courses at Rutgers University. In addition to his interest in the New Jersey SPE, he is active in many other associations, including the New Jersey Section of the American Water Works Association and the American Public Works Association.

F. F. Hohnholt, P.E., was born in Jersey City in 1899. He attended the Cooper Union, Mechanic Institute, and City College of New York, and he is presently employed as Manager of package generator sales with the Foster Wheeler Corporation, N. Y. In addition to his membership in the NJSPE and other engineering societies, he has been very active in civic affairs and served for two elective terms (6 years) as councilman in the Borough of Leonia, being President of the Council during one year of this period.

New Mexico. W. K. Wagner, P.E., born December 19, 1906, at Eddyville, Nebraska, received his education at the South Dakota School of Mines, and his B.S. in C.E. from the University of New Mexico. From 1948 to the present, he has been employed as Engineer for Albuquerque Gravel Products Company, in charge of concrete mixes, aggregate production, and precast products.

New York. C. A. Dutton, P.E., born January 1, 1899, at Oneida, New York, is a graduate of Massachusetts Institute of Technology with an S.B. in General Engineering. He was President of the Erie County Chapter from 1950-51. Mr. Dutton is now Company Director and Manager, Construction Sales for the Buffalo Electric Company, Inc. He is a member of the Niagara Falls Country Club, American Legion, Buffalo Chamber of Commerce, and several other organizations. He has held several offices on the State and National levels.

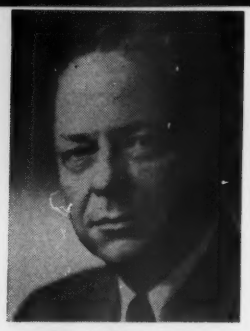
H. F. Roemmele, P.E., born January 1, 1904, is a graduate of The Cooper Union with a B.S. in M. E. achieved in 1925 and an M.E. degree awarded in 1934. After a brief period with General Electric in Schenectady, in 1927 he joined The Cooper Union faculty and has remained with that institution advancing from the position of Instructor in Mechanical Engineering to the post of Dean of Students, which he has held since 1951. Active in many engineering and educational organizations, he is at present the Second Vice President of the NYSSPE and immediate Past President of the New York Chapter. He lives in Port Chester.

North Carolina. M. F. Wooten, Jr., P.E., born April 8, 1906, at Charlotte, N. C., received his education from the University of North Carolina. In 1950, he was President of the Prof. Engrs. of N. C. and, in 1951, Governor. He is a member of the Rotary Club, Charlotte Country Club, Trustee, Fishburne-Hudgins Educational Foundation, Waynesboro, Va., and holds membership in several other organizations. Mr. Wooten is a partner with Wooten & Wooten, Consulting Engineers & Architects.

North Dakota. R. H. Myhra, P.E., born May 14, 1903, in Wahpeton, N. D., was graduated from the North Dakota School of Science. He has been employed by the North Dakota State Highway De-

F. F. Hohnholt
New Jersey

W. K. Wagner
New Mexico



C. A. Dutton
New York

H. F. Roemmele
New York

M. F. Wooten, Jr.
North Carolina

R. H. Myhra
North Dakota

R. E. Allen
Ohio

R. A. Freese
Ohio

C. A. Dunn
Oklahoma

G. W. McCullough
Oklahoma

partment and was County Engineer of Cavalier County from 1934 to 1936. He served with the U. S. Corps of Engineers from 1942 to 1945 and is now with the Truax-Traer Coal Co., Minot, N. D. He has held various offices in the North Dakota SPE, including the presidency in 1952.

Ohio. R. E. Allen, P.E., received his engineering education at Ohio State University. He received a degree of Bachelor of Industrial Engineering in 1934 and a Professional Degree in Civil Engineering in 1942. From 1945-46, he was Secretary-Treasurer of the Dayton Society of Professional Engineers, President in 1947, Trustee in 1947 of the OSPE. Mr. Allen is Chief Engineer for the Univis Lens Company of Dayton.

R. A. Freese, P.E., has a degree in Civil Engineering from Case Institute of Technology and is Cleveland District Manager of Armco Drainage and Metal Products, Inc. Prior to his affiliation with Armco, he was associated with a consulting engineer, contractors, and with the Ohio Highway Department as Assistant Division Engineer. He is a charter member of the Cleveland SPE and has held various chapter offices including the presidency. He is immediate Past President of the Ohio SPE and is currently serving on NSPE's Inter-Professional Relations Committee.

Oklahoma. C. A. Dunn, P.E., born September 9, 1901, at Stocking, South Dakota, received degrees of B.S. in C.E. from the University of Wisconsin; C.E. in C.E. and M.S. in C.E. from Oklahoma A.&M. College; and Ph.D. in C.E. from Cornell University. He was President of the OSPE in 1948. Dr. Dunn is a member of the A.S.C.E., American Society for Engineering Education, Phi Kappa Phi, Sigma Tau and Chi Epsilon. He is now Professor of Civil Engineering and Executive Director of the Division of Engineering Research, Oklahoma Institute of Technology, Oklahoma A&M College.

G. W. McCullough, P.E., born in Lynnville, Ind., April 1, 1904, holds a B.S. degree in M. E. from Oklahoma A & M College. He is currently Vice President and Chairman of the Operating Committee of the Phillips Petroleum Company, with which he has been associated since 1925. Immediate Past President of the Oklahoma SPE, he is also a member of the American Petroleum Institute, the Independent Petroleum Association of America, the Armed Forces Chemical Association, and other professional and fraternal organizations.

Pennsylvania. R. A. Blackburn, P.E., born in Dayton, Ohio, on October 15, 1908, was graduated from Ohio State University with the degree of B. Met. E. and from the University of Washington with the degree of M.Sc. in Metallurgy. He held Research Fellowship, U. S. Bureau of Mines, Seattle, Washington from 1933-34 and was Nathaniel Wright Lord Fellow at Ohio State University from 1934-35, while working on his Ph.D. He served as President of the Pittsburgh Chapter from 1947-48 and Past President of the PSPE from 1950-51. At present he is Assistant Chief Project Engineer of Koppers Company, Inc., in Pittsburgh.

A. H. Kidder, P.E., born December 25, 1899, at Proctor, Vermont, attended the University of Vermont for two years and received his B.S. in E.E., and Master's degree from M.I.T. He has held several offices on the State level. He is employed by the Philadelphia Electric Company as Assistant System Development Engineer in charge of all engineering having to do with the Company's system planning and engineering development projects. He has also written several articles for publication.

E. K. Nicholson, P.E., born May 23, 1899, Lakewood, Ohio, graduated from Ohio State University with a B.M.E. in 1921 and an M.E. in 1928. He is a member of Franklin Institute, A.S.M.E., and Phi Kappa Psi. Mr. Nicholson has held several offices on the State and National level. Presently, he is Chief Engineer of Rohm & Haas Company's Lennig Plant in Philadelphia.

D. C. Peters, P.E., President and General Manager of the Mellon-Stuart Company, Pittsburgh contracting engineers, graduated from Marquette University in 1938 with a B.S. in C.E. He is a member of various engineering societies, as well as the Young Presidents' Organization, and has been active in civic and civil defense planning in the Pittsburgh area. He has recently been chosen as one of one hundred young leaders of Pittsburgh's future by the local Chamber of Commerce and *Time Magazine* jointly.

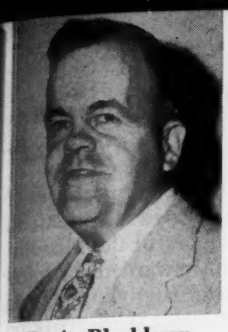
Puerto Rico. Alberto Hernandez, P.E., was born June 6, 1903, in Mayaguez, P.R. He received a B.S. in C.E. from the University of Puerto Rico in 1926 and an M.A. from Harvard in 1935. He has taught in the University of Puerto Rico's College of Agricultural and Mechanical Arts and has done engineering work in various capacities with agencies of the Island's government. He is now Chief, Technical Section, Puerto Rican Field Office, Public Housing Administration. He is a member of numerous professional engineering groups and of the New York Academy of Sciences.

Rhode Island. Vincent DiMase, P.E., is a graduate of Brown University in the Civil Engineering Course, class of 1935. He continued his engineering education at Brown by taking advance courses. He was President of the Clavis Cultural Club from 1938-41, Secretary of the Rhode Island SPE from 1946-48 and has held several offices since then. Mr. DiMase is Deputy Inspector of Buildings in Providence.

South Carolina. C. L. Cheves, P.E., Vice President of the Daniel Construction Company, Inc., Greenville, S. C., is a civil engineering graduate of Clemson College and has also taken advanced management courses at the Harvard Business School. During World War II he served as a colonel with the Corps of Engineers, in charge of maintenance of the Alaska Highway. He is also a past president of the South Carolina section, A.S.C.E.

Tennessee. Warner Howe, P.E., graduated from Cornell University in Civil Engineering in 1941. He worked with the U. S. Engineers, 1941-42, in civilian capacity, as engineer on the design of the Panama Canal Locks, Structural Section. From 1946-48, he worked with Gardner & Howe, Structural Engineers, Memphis, as Chief Designer and since 1949 has been a partner. Mr. Howe was President of the Memphis Chapter in 1951.

Texas. N. E. Hull, P.E., a native of Ohio, is Vice President and General Manager of the Dickson Gun Plant operated by the Hughes Gun Company in Houston. He

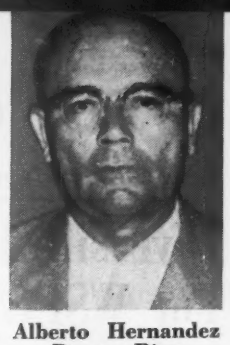


R. A. Blackburn
Pennsylvania

A. H. Kidder
Pennsylvania

E. K. Nicholson
Pennsylvania

D. C. Peters
Pennsylvania



Alberto Hernandez
Puerto Rico

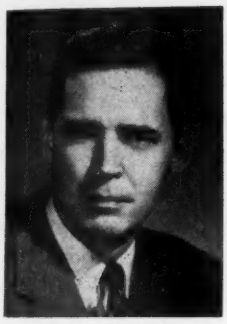
Vincent DiMase
Rhode Island

C. L. Cheves
South Carolina

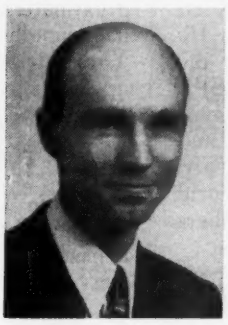
Warner Howe
Tennessee

N. E. Hull
Texas

W. P. Henoch
Utah



J. B. McGaughy
Virginia



H. A. Stingle
Washington

L. C. Gates
West Virginia

H. G. Kennedy
West Virginia

A. G. Behling
Wisconsin

E. J. Kallevang
Wisconsin

holds a B.S. in C.E. from Purdue University, served with the Engineer Corps during World War I, and has had varied industrial experience. In addition to his professional engineering affiliations, he has been active in the American Ordnance Association, the Houston Chamber of Commerce, the Industrial Committee of the National Fire Protection Ass'n., the Texas Manufacturers Association, and numerous other organizations.

Utah. W. P. Henoch, P.E., was born in Salt Lake City, February 28, 1906. He obtained a B.S. degree in Mining and Metallurgy from the University of Utah in 1929, and in 1934 was awarded a fellowship and gained an M.S. degree in Mining from the same school. Now affiliated with the Monroe Food Machinery Company as Branch Engineer, he has a record of work with various mines and smelters in the west as well as with the U. S. Army Engineers.

Virginia. J. B. McGaughy, P.E., born November 5, 1914, in Norfolk, Virginia received a degree of B.S. in C.E. from Duke University in 1938. He is a Past President of the VSPE and is a member of the Engineers Club of Hampton Roads, American Concrete Institute, Rotary Club, Virginia Club and Norfolk Yacht & Country Club. Mr. McGaughy is senior partner in John B. McGaughy Associates, Consulting Engineers.

Washington. H. A. Stingle, P.E., graduated from the State College of Washington in 1932 with a B.S. in E.E. He has served as President of Associated Engineers of Spokane, President of the Spokane Chapter of the American Institute of Electrical Engineers and President of the Washington Society of Professional Engineers. Mr. Stingle is Superintendent of Buildings and Grounds for the Spokane Public Schools.

West Virginia. L. C. Gates, P.E., a West Virginia native, holds a B.S. degree from Virginia Polytechnic Institute. He served with the Corps of Engineers during World War II and, since 1946, has been an associate in the Ferguson-Gates Engineering Company, Beckley, W. Va., a consulting firm interested chiefly in coal development and other allied fields. He is a charter member of the Appalachian Chapter, West Virginia SPE, and served as the eighteenth President of the State Society in 1951. He is active in other engineering organizations and civic associations, currently serving as the president of the Beckley Area Chamber of Commerce.

H. G. Kennedy, P.E., born May 19, 1903, in Coal Run, West Virginia, received the degrees of B.S. in E.M. and M.S. in E.M. from West Virginia University. He is a Past President of the W.Va.SPE. Mr. Kennedy is a member of the Kappa Sigma, Sigma Gamma Epsilon, A.I.M.E., Masons, Shriners and the Rotary Club. At present, he is Executive Secretary of the Kanawha Coal Operators Association.

Wisconsin. A. G. Behling, P.E., was born October 2, 1905, in Oshkosh, Wisconsin. In April, 1933, Mr. Behling set up his own office as consulting engineer, specializing in steam power plants. He was selected "Engineer of the month" for September, 1951, by *Milwaukee Engineering*. He is a member of the E.S.M. He served several years on the advisory committee of the Milwaukee Department of Safety Engineering, and is presently serving a five-year term on the advisory committee to the Milwaukee County air pollution control engineer.

E. J. Kallevang, P.E., was born November 27, 1889, in Decorah, Iowa. He is Chief Engineer of the Wisconsin Power and Light Company, Madison, and has served in various official capacities with the Wisconsin SPE. He is a life member of the American Institute of Electrical Engineers and also belongs to the Wisconsin Utilities Association, the Engineering Committee of Edison Electric Institute, the Salvation Army Advisory Board, and other groups.

With Our Members . . .

Wisconsin News

Diversified Program Is Announced For WSPE's Annual Summer Convention

The seventh annual summer convention of the Wisconsin SPE has been scheduled for Elkhart Lake, Wis., September 18-19. The meeting program will include educational, business, and entertainment features, with the Fox River Valley Chapter in charge of the latter activities.

Principal speakers at the business meeting will be Paul H. Robbins, NSPE executive director, and E. W. Seeger, NSPE vice president. Mr. Robbins will speak on professionalism versus unionism and other items of current interest, while Mr. Seeger will discuss unity within engineering ranks in the handling of professional problems.

A visit to the Kohler Factory, a tour of Kettle Moraine Park, and a special program for the ladies are among the other highlights being planned by the Program Committee of which Orrin E. Andrus of Milwaukee is chairman. Robert Mendenhall, also of Milwaukee, is in charge of publicity for the event.

Arizona News

Both the Arizona Society of Professional Engineers and its Central Chapter have new presidents as a result of action taken by their respective boards of directors. The new president of ASPE is Benjamin McLain of Tucson who was appointed to serve the balance of the 1953 term of former President David Bartholomew. The latter resigned his office in order to accept a new position as chief of instrumentation at the Air Force Arnold Engineering Development Center, Tullahoma, Tennessee.

Similarly, Walter Biddle has been named to assume the Central Chapter presidency following the resignation of Carl Poppino due to the pressure of business activities. Clyde Stauffer is now serving as vice president and program chairman of this chapter, and James Martin has replaced Engineer Stauffer as trustee-at-large.

Missouri Looks Ahead To Annual Meeting

Plans are well under way for the annual meeting of the Missouri Society of Professional Engineers which is to be held in Columbia, October 16-17, at the Tiger Hotel. Among the speakers at the meeting will be NSPE President T. Carr Forrest, Jr., Mayor Raymond R. Tucker of St. Louis, and Dr. John H. Furbay, director of air-world education with Trans World Airlines. Central Chapter members will be hosts for the occasion.

Capital Chapter, ISPE, Holds Family Picnic

Douglas Park, Springfield, Ill., was the scene of the annual family picnic sponsored recently by the Capital Chapter of the Illinois Society of Professional Engineers. A committee headed by E. S. Rynearson was in charge of arrangements for the event.

A P.E. refresher course starting this month is also on the Capital Chapter agenda, and plans are underway for the distribution of Past President Certificates at an early fall meeting.

J. E. Vollmar Complete Three-Year Dock Stud

Joseph E. Vollmar, Jr., president o Vollmar Bros. Construction Co., S Louis, and a member of the Missou SPE, was recently awarded a Profes sional Engineer in Civil Engineerin degree by Washington University o the basis of his just-completed three year study of *Docks and Dock Struc tures on the Upper Mississippi.* T prepare his thesis, which deals wit the practical aspects and theoretica designs of all types of mooring struc tures used for loading and unloadin towboats and barges, Mr. Vollma visited and inspected 127 differen marine installations.

"Few people realize the tremendou amount of traffic that is handled o the inland waterways each year," h said, explaining why he made th three-year study. "In fact, river ton nage handled on the Mississippi an its connecting rivers during 1952 ap proximately equalled the entire ton nage handled through the Port of New York during the same period."

Ritchie Lawrie, Jr. Receives New Award

Ritchie Lawrie, Jr., a prominen member of the Pennsylvania SPE an a past president of the National So ciety, has been given the Certificat of Merit and the Award of th Patriotic Order Sons of America.

Harvey E. Stoehr, Pennsylvani state president of the Order, an nounced that the honors are given "t those of our country's citizens wh have shown an outstanding an marked interest in the welfare of our country . . ." Mr. Lawrie was nomi nated for the award by the PSPE a the request of the Order.

The Certificate and Award were presented to him during the state con vention of the Patriotic Order.

. . . more news on page 38

PUERTO RICAN SCENES—The pictures below were taken during a recent banquet given by the members of the Puerto Rico Society of Professional Engineers in honor of Sidney L. Stolte, an NSPE past president, who was visiting the Island. In the photo at the left, Puerto Rico SPE President Alberto Hernandez (second from left) is engaged in conversation with Mr. Stolte (extreme right) and two other members of the Society. At the right, is a general scene photographed before the banquet started; Mr. Stolte is seated in the place of honor.

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Joint Dinner Meeting In Oakland, Cal.

August 17 was the date of an engineers' dinner meeting at Hotel Leamington, Oakland, Cal., sponsored jointly by the East Bay and Golden Gate Chapters of the California SPE in cooperation with other engineering societies.

Featured speaker for the event was John K. Chapel, well-known radio commentator who has recently returned from a European tour. Among the other distinguished guests were: John Hassler, Oakland city manager; Kendrick Moorish, president of the Oakland Chamber of Commerce: and R. Dudley Conness, president of the Berkeley Chamber of Commerce.

TEXAS P.E.'s—Paul J. Hurd (right), president of the Galveston County Chapter, TSPE, presents J. C. Webb (center) with a TSPE membership certificate while M. C. Wilson, secretary-treasurer of the chapter, looks on. Mr. Webb, recently licensed by the Texas State Board, holds License No. 10,000. All three are employed by the Pan American Refining Corporation in Texas City.

With the Ladies

By MRS. WILLIAM FELL
NSPE Ladies' Advisory Committee

Officers of the NSPE Ladies' Advisory Committee for the year July 1, 1953, to July 1, 1954, are:

Chairman: Mrs. Frank Chappell
Dallas Chapter Auxiliary, Texas SPE
4419 Cole Avenue, Dallas, Texas

Vice-Chairman of Northeastern Area:
Mrs. Kenneth H. Fox
Monmouth-Ocean Auxiliary, New Jersey SPE
105 Woodland Drive, Fair Haven, N. J.

Vice-Chairman of Southeastern Area:
Mrs. B. O. Vannort
South Piedmont Chapter Auxiliary, North Carolina SPE
Charlotte, North Carolina

Vice-Chairman of Central Area:
Mrs. C. E. Bischoff
Franklin County Chapter Auxiliary, Ohio SPE
2835 County Line Rd., Westerville, O.

Vice-Chairman of Southwestern Area:
Mrs. Olaf Lodal
Bexar Chapter Auxiliary, Texas SPE
217 Castano, San Antonio, Tex.

Vice-Chairman of Western Area:
Mrs. Donald Stoneman
Los Angeles Chapter Auxiliary, California SPE
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Salary up to $12,000 for Application (Sale... Engineer. Sales experience in electric... controls or electric motors preferred. M... have sales personality and outstandi... record. Age to 42. Location: Wiscons... Mail resume, including non-returnab... snapshot photo, if available, to Box 82... AMERICAN ENGINEER.

PROJECT ENGR. Work involves highl... diversified design including plant layou... all phases of constr. including elec. equi... ment, process equipment, specs and calc... lating. Good opportunity for advancement... $6,000 to start. List your qualifications... Write Box 903, AMERICAN ENGINEER.

OHIO—Industrial Engineers—4 position... Materials handling, time and motion stud... cast methods, and production control. Ag... 26-40. $5,000-$8,500. Will pay moving e... penses. Make application to Box 80... AMERICAN ENGINEER.

Civil Engineer and Surveyor. Experienc... in water and sewage plant construction. T... supervise construction for consulting eng... neering firm operating throughout Ohi... Salary open. Send resume to Box 90... AMERICAN ENGINEER.

Positions Wanted

PROFESSIONAL ENGINEER—HERE IS YOUR GOOD RIGHT HAND

Mature, well-educated woman will be your good right hand . . . will carry the burden of operating your engineering office. Nine years of experience as purchasing and contracting officer for U. S. Engineers, including cost-plus contract accounting. Capable office manager or executive secretary with supervisory experience in personnel, management methods, public relations and stenography. Available on short notice. For full resume write Box 8-G AMERICAN ENGINEER, 1121 15th Street, N.W., Washington 5, D. C.

Kings County Chapter Announces Lecture Series

The Kings County Chapter, New York State SPE, has announced a new lecture course on *Patent Information* to be given by S. Plosky, LL.B., beginning October 7 at chapter headquarters.

The Kings County headquarters will also be the scene of the review courses for P.E. examinations which are sponsored by the New York State Society. Two sections of the review series—*Structural Design* and *Basic Engineering Sciences*—are scheduled to begin September 16. The third course, *Engineering Economics and Professional Practice*, will start November 13.

S. S. Aidlin is chairman of the Kings County Educational Committee which handles the arrangements for the lectures.

Galveston Social Event

A spaghetti and chicken dinner and a boat trip through Galveston Harbor were the highlights of a late summer meeting of the Galveston County Chapter, Texas SPE. P. J. Hurd is president of the group.

Strictly Business

Personalities . . . FRANK W. EDWARDS, since 1948 director of civil engineering at the Illinois Institute of Technology, is now in charge of the new Chicago office of the STANLEY ENGINEERING COMPANY. The company's headquarters office is in Muscatine, Iowa. . . . HAROLD F. SOMMERSCHIELD has been named assistant to R. I. JERVIS, manager of the CAPITOL STEEL DIVISION, HAUSMAN STEEL COMPANY of Toledo. Mr. Sommerschield's office will be in Lansing, Michigan. . . . WILBUR WATSON ASSOCIATES, Cleveland, Ohio, have announced the appointment of W. A. SARGEUNT as chief mechanical engineer. . . . SCIENTIFIC DESIGN COMPANY, INC., has announced the selection of DR. PHILIP E. NEWMAN as European representative.

Mr. Edwards

PAUL R. MARTIN, JOSEPH F. NIMS, and EDWARD J. ROBESON, III, have been appointed as supervisors with THE CHEMSTRAND CORPORATION'S new nylon plant under construction in Pensacola, Florida. Engineers C. A. G. BLOMQUIST, JR., JAMES E. BOYD, SCOTT BRODIE, ALVA C. COGGESHALL, WILLIAM H. DRAGOSET, THOMAS F. FURLONG, and JOSEPH R. MARTIN are also joining the CHEMSTRAND Pensacola staff in various capacities. . . . ROBERT ANDERSON has assumed the newly created position of foundry engineer with the HYSTER COMPANY in Portland, Oregon. . . . DR. CLYDE MCKINLEY has been appointed director of research for AIR PRODUCTS, INC., of Allentown, Pa. . . . GEORGE SCHUMANN has been named to the newly created position of chief design consulting engineer for KAISER ENGINEERS, Oakland, Cal.

LOUIS A. SACHA, JR., manager of sales, GROTHE & SWANKER, INC., Cleveland consulting engineers and designers, has been elected a vice president and director of the firm. . . . K. T. DAVIS is now director of engineering and product development for BRYANT HEATER DIVISION, AFFILIATED GAS EQUIPMENT, INC., Cleveland, Ohio. . . . J. C. MERWIN has been elected chairman of the board of directors, CHAIN BELT COMPANY of Milwaukee; and L. B. MCKNIGHT has been named to succeed him as president and chief executive officer of the company. . . . Three field service engineers with AIR RESEARCH MANUFACTURING COMPANY, Los Angeles, will soon be working in the European theater. They are: FREDERICK K. BAUER, assigned to handle technical service agreements with aircraft factories and airlines, and DONALD M. MILLER and DONALD S. CAMPBELL who will be assigned to the U. S. European Command, Military Assistance Division Headquarters, Frankfurt, Germany. . . . The following personnel changes are now in effect at the PERFECTION STOVE COMPANY, Cleveland, Ohio: MARC RESEK is now vice president in charge of all research; W. H. HAAG is vice president of manufacturing, engineering, and purchasing; and W. M. DAY has been placed in complete charge of the engineering department. . . . J. S. THOMPSON, A. A. BROWNE, and T. CHALLONER have been named to the board of directors of FEDERAL ELECTRIC PRODUCTS COMPANY, Newark, N. J. The three are top officials of PACIFIC ELECTRIC MANUFACTURING CORPORATION, recently acquired by FEDERAL ELECTRIC.

Mr. Davis

Comments of Note . . . The WESTINGHOUSE ELECTRIC CORPORATION'S East Pittsburgh plant alone "has lost more than $7 million worth of business and about a million man-hours of work" since January 1, 1952, because of government contracts awarded to foreign companies, said JOHN K. HODNETTE, vice president in charge of the Industrial Products Division, in a recent speech. On this same business, he added, "the United States Government has lost more than $1.8 million in taxes."

Jobs are in danger, Mr. Hodnette warned, if foreign companies using low-wage labor are permitted to take government orders away from American electrical firms. This is the chief reason why foreign companies are able to underbid U. S. competitors, he said, pointing out that latest (June, 1952) foreign wage statistics available show that the average hourly rate in manufacturing in Switzerland is 53 cents; England, 43 cents; France, 41 cents; and Italy, 31 cents, as compared with a U. S. average of about $1.74. The average Westinghouse hourly wage, he said, is $2.10, with an even higher average in the East Pittsburgh installation.

Coal "still is the fuel choice for some two-thirds of the new plants private utilities have built since Korea or are planning to build in the immediate future," said RICHARD RELF, chairman of the board and president, NORTH WESTERN HANNA FUEL CO., speaking recently before the annual meeting of the Conference of State Utility Commission Engineers. "We believe," he stated further, "that coal will remain the basic fuel source of the electric utilities industry and American industry generally."

Reorganization and Changes . . . ALLIED RESEARCH ASSOCIATES, INC., have moved their offices to 43 Leon Street, Boston 15, Mass. . . . The DELUXE SAW AND TOOL COMPANY, a subsidiary of ROCKWELL MANUFACTURING COMPANY of Pittsburgh, Pa., is transferring its national headquarters and out-of-state manufacturing facilities from Chicago, Ill., and Columbus, Ohio, to its High Point, North Carolina plant. . . . SOUTHWEST WELDING & MANUFACTURING COMPANY, Alhambra, Cal., has established a New York Sales Office with W. F. HEFFERNAN as district sales manager. . . . The L. L. RIDGWAY COMPANY, architects' and engineers' supplies firm, has opened new sales, advertising and purchasing offices in Chicago with T. COATNEY as general sales manager and PAUL PHIPPS directing advertising and promotion. . . . A new design and engineering department has recently been added by the Los Angeles construction firm, MCDONALD BROTHERS, according to an announcement by LLOYD MCDONALD. RUSSEL D. KOONS heads the new division, while GEORGE S. BALLEW takes over the management of MCDONALD'S service departments for the petroleum industry.

Plant Expansion . . . Four new open hearth furnaces have been completed for the LONE STAR STEEL COMPANY at Lone Star, Texas, according to the RUST FURNACE COMPANY of Pittsburgh. The open hearths are part of LONE STAR STEEL'S $87,000,000 expansion of steelmaking facilities and construction of a new pipe mill for production of oil field tubular goods.

What's New

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Please send information on Item 1 to:

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SELF POWERED HOLE DIGGER — Item 1

Just introduced by the Multi-Matic Corporation, the Super Hole-A-Matic digs holes —at any angle—from four to eight inches in diameter, up to six feet deep with a shaft extension. For pipe installations, it will tunnel up to 12 feet deep. Perfect for post holes, sign installations, concrete pier holes, etc.

Specially designed hardened alloy steel blades chew up softer shale but ride above large rocks without damage. Operates on AC or DC.

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COVERED GLASS RETICLES ON GURLEY INSTRUMENTS — Item 2

Covered glass reticles, which permit cleaning of survey instrument reticles without danger of destroying the fine lines, are now a feature of Gurley transits and levels, manufactured by W. & L. E. Gurley, 108-year-old manufacturer of engineering and surveying instruments.

With the covered glass reticle, any dust which may drop on the surface of the glass will not be in the focal plane of the crosslines.

The Gurley cover glass is cemented in place over the pattern.

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Please send information on Item 3 to:

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NEW CONVEYOR FOR BUILDERS — Item 3

The "Fairfield Builder," a conveyor specially designed for contractors and builders, handles bricks, blocks, tile, mortar, lumber, and most other building materials.

By adding one or two 8-foot boom sections, the 24-foot base machine can be converted into a 32-foot or 40-foot conveyor.

In one minute the Builder raises 70 bricks, 35 concrete blocks, or 35 rolls of roofing. Because of its balanced construction, one man can move it on the job and it can be readily towed from job to job by either truck or car.

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Please send information on Item 4 to:

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ELECTRONIC LIQUID LEVEL CONTROL — Item 4

New Belmont Level Control unit consists of the probe which is mounted directly at the location of the controlled liquid; a connecting cable which can be 1,000 feet long if necessary; and the control unit which can thus be located for operating convenience.

Among applications are low-side refrigerant-level control in refrigeration plants; liquid level, interface, proportioning and blending control in petroleum refineries; level control for packaging or production checking in chemical plants; filler, measuring, mixing and operation controls in food processing plants; and similar applications.

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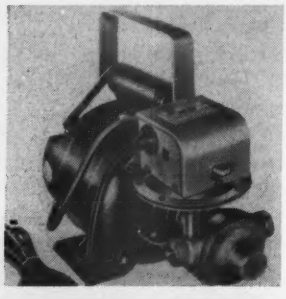
HYPRO PORTABLE PUMP WITH VACUUM-SWITCH — Item 5



Incorporating a special vacuum switch, which shuts itself off when the liquid supply runs dry, Hypro Portable pump weighs only 27 lbs. and has a hinged carrying handle. It will lift water up to 10 feet unprimed, 22 feet primed. Capacity up to 5 gallons per minute with pressures up to 30 lbs. Handles liquids ranging in viscosity from alcohol to syrups.